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CRIPPLING DISEASES OF CHILDHOOD: TOPIC OF THE MONTH

# THE JOURNAL

OF THE

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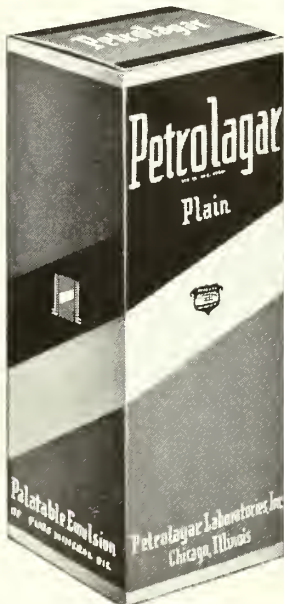
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### PRESENT DAY TRENDS IN THE TREATMENT OF SCHIZOPHRENIA

WILLIAM MALAMUD, M.D.

AND

J. S. GOTTLIEB, M.D.

IOWA CITY, IOWA

In 1928 Sakel made a discovery which, although it may not have achieved all the therapeutic results that some have claimed for it, has nevertheless succeeded in stimulating a most promising wave of interest in the investigation of schizophrenia. Sakel was at that time experimenting with the treatment of morphine addiction by the administration of insulin. During the course of this work he observed repeatedly that the occurrence of hypoglycemia in the cases to which high doses of insulin were administered and particularly the development of hypoglycemic coma seemed to have a beneficial effect upon the states of excitement that are met with during the course of the withdrawal of morphine. This quite naturally led him to attempt a similar method in the treatment of excitements of other kinds, including schizophrenia. The results were so promising that he decided to investigate the treatment of schizophrenia in general by this method and in 1934 he first published the results of the treatment of a series of schizophrenic patients by the method of induction of insulin shock or coma. His report almost immediately started a world-wide series of investigations of this subject.

In this country systematic attempts with insulin treatment were begun about the beginning of 1936 and in the astoundingly short period of time since then this method has evoked all the possible phases of reaction running from the most enthusiastic and totally unwarranted optimism to cautious rechecking with a permissible degree of skepticism, and finally a swing in the opposite direction with a tendency to discount in a decidedly unjustifiable manner even that degree of efficacy which this method

of treatment has undoubtedly been shown to have. The detailed account of the history of this development, the reports of various workers in this field and the description of the technic of the method need not be given since a fairly complete literature is available and will be referred to in the bibliography. One might just mention that this method of therapy, which has now become known familiarly as "shock treatment," is in the minds of most people closely associated with another variety, namely, the use of metrazol for the purpose of inducing convulsions. This method was introduced by von Meduna shortly before Sakel's publications and has gained momentum in the process of the spread of insulin treatment, both of the treatments being included under the so-called "shock" therapy.

Discussion in this paper could be summed up in terms of answers to the following questions: (1) What are the comparative merits of the "shock" treatment and previously established therapeutic methods? (2) What are the actual results as published by unprejudiced investigators in all of these methods? (3) Why was this method so enthusiastically received at first and then in some cases led to such decided disappointment? The answer to the last question is probably the most obvious and might also serve as an introduction to the others.

Schizophrenia is undoubtedly one of the most serious diseases known, not only in psychiatry but in medicine in general. A recent survey by the Mental Hygiene Committee places the number of persons afflicted with mental disease in this country at 450,000. In 1931, May, in his review of the problem of schizophrenia, stated that half of the patients cared for in hospitals for mental diseases are diagnosed as having schizophrenia. This would mean that approximately 200,000 men and women, most of them still in the prime of life, and most of them with good physical endowment and originally of, at least, an average intelligence, are suffering from a disease which makes them useless to themselves and a burden to society; the great majority seemingly doomed to a progressive and, apparently, unpreventable disintegration of their per-

sonality. At the same time, up until comparatively recently practically nothing was known of the etiology, pathology and any reliable methods of treatment for this disease. Little wonder then that the introduction of any method that offered the least ray of hope in salvaging these patients from such a serious fate, and particularly one holding out such brilliant promise as the "shock" method was claimed to have, should immediately be seized upon and exploited to the greatest extent. One can also experience no surprise at all that the slightest indication of failure would naturally lead to a swing in the opposite direction, to complete disappointment. The development of such an attitude is rendered still more likely when we consider that the introduction of a successful method of treatment in a disease of this type offers not only the promise of practical success in therapy but also a possible wedge into the mystery of the causation of this disease and its pathology.

It is quite clear that in order to obtain an objective and unprejudiced analysis of the real value of this new method we must divorce ourselves as much as possible from all prejudices. One of the first things we want to do is ascertain what insulin treatment is actually accomplishing, particularly as compared with methods of treatment that were introduced before it. Much as it may surprise some who have not kept in close contact with the progress of psychiatry, therapeutic efforts, some of them rather promising in nature, had been carried on for some time before Sakel's discovery. Perhaps the first systematic attempts were those introduced more or less simultaneously by three leaders in psychiatry, Bleuler, Adolf Meyer and Freud. Whatever the differences may be between the specific characteristics of the points of view expressed by these three and whatever the different names may be that are applied by their followers to the methods that they have advanced, it seems that the fundamental principle involved in all three is actually the same. All of them working from their own points of attack have made what may appear as an almost tritely obvious discovery, i. e., that patients suffering from schizophrenia are essentially human beings who, just like all others, have their life problems and conflicts and are frustrated by the same obstacles although they may react in a different manner. Whatever else one may want to do in trying to help these people, one must know them and understand the manner of the development of their personality, the particular difficulties that they have encountered in attempting their adjustment and, having grasped these, try to recondition and re-educate them on the one hand and, on the other, attempt to remove as many of the conflicting situations as is possible. It is true that technically the manner of analyzing the situation and obtaining an adjustment may be quite different depending upon which of the three points of view one chooses to follow. In all of these, how-

ever, it is of prime importance to obtain as good a contact with the patient as one possibly can with whatever means may be at one's disposal and to get the patient to face the situation instead of trying to take refuge in the unusual way in which a schizophrenic patient does. It would take us too far afield to give a complete description of any one of these methods of treatment, let alone all of them. In a previous publication an attempt was made to outline such a systematic approach which has been used with the patients at the Iowa State Psychopathic Hospital.

Since some definitely specific technics have been attached to certain names chosen by various workers in this field, it is of no particular value to try and designate this general method of treatment by any special name. Some of us refer to it as psychotherapy, others quite justifiably may feel more comfortable in just referring to it as a "common sense" analysis of the patient's life problems; but whatever we do, it is doubtful whether there is any justification in referring to this type of treatment as "nonspecific," which actually has been the term applied to it by some psychiatrists. It would seem, with the meager knowledge that we possess at present of the possible etiology and pathology of this disease, that if any method can be designated as specific it certainly could be no other than the one just outlined since it is the only one that attempts to deal with problems that seem to be at least partly at the basis of the maladjustment.

Until today this method has been used to a greater or less extent in the attempt to help the patients suffering from this disease. It is true and naturally to be expected that it is not a particularly easy task, requires a great deal of patience, is quite time consuming and, the schizophrenic patient being notorious for his poor contact and lack of interest in anything around him, it is sometimes an exasperating task since the patient repels most of our attempts. It was because of this and also because the successes in terms of numbers have not been particularly high that, throughout the years since the introduction of this manner of treatment, attempts always have been made to find some easier and simpler way, and one that would seem more concrete and more tangible.

The attempts that have been made along this line are too numerous to be discussed here in their entirety. Only a few of the more outstanding ones can be briefly mentioned. We have the once highly advertised "focal infection" fad; drugs such as cocaine and sodium amytal; continued narcosis treatment; the use of endocrine substances; hyperthermia; some of the heavy metals, and even surgical intervention. All of those have come and gone and so far as can be seen the only traces they have left behind are dependent upon either one of two factors: (1) Some of these have helped in dealing with certain incidental and accessory disturbances in the patients treated and are useful because of



their general effects in increasing the efficacy of the function of the organism. (2) Others such as sodium amytal have come to be regarded, and justifiably so, as aids in developing a good contact between the patient and his physician. At present, therefore, in trying to determine the actual value of the "shock" treatment, we would have to compare its results with those that have been obtained by the use of the psychotherapeutic method. In doing this we shall have to depend upon figures given by investigators who have tried to deal with the matter in as objective and unprejudiced a manner as possible. For this purpose I have selected a series of reports in the current literature and these have been tabulated in table 1.

hardly be fair to compare these with the results in the patients that were treated by insulin or metrazol.

In order to make such a comparison more adequate, we have included in the table two series of cases treated in psychopathic hospitals by what would generally be termed psychotherapeutic methods. In this material we have chosen only those patients who have been out of the hospital for five years or longer and in whom the outcome of the treatment can be more adequately judged than in those recently discharged. This permits the use of 142 cases out of the 500 recently reported by Cheney and 177 patients of our own that have been followed for a similar period of time. When we

Table 1

Author	Nature of Treatment	Number of Cases	Per Cent Recovered*	Per Cent Much Improved	Per Cent Improved	Period of Follow-up
Ross	Insulin	1356	14.2	20.6	26.3	2 yrs. or less
Ross	Metrazol	523	4.4	9.8	32.1	2 yrs. or less
Ross	Untreated	1039	3.5	11.2	7.4	2 yrs. or less
Cheney and Drewry	Psychotherapy	142	11	10	13	5 yrs. and over
Malamud and Render	Psychotherapy	177	14	11	7	5 yrs. and over
		39	31	10	8	2 yrs. or less
	Mecholyl	23	34.8	17.4	17.4	2 yrs. or less

\*These figures represent proportions per cent.

The list is headed by a recent report from the New York State Hospital Service based on a large number of patients treated by insulin and metrazol, and added to this are the results in a large number of untreated cases. It must be mentioned that both the insulin and metrazol data consist of cases which were treated comparatively recently, in some the treatment having been completed only six months or less before the report. In the insulin treated patients the author mentions that of those marked as "recovered" or "improved" 126 patients (slightly less than 10 per cent of the whole number) have already been returned from parole as having suffered a relapse. This, of course, serves as a warning of how much caution we must exercise in the evaluation of any method of treatment of this disease. It is well known that schizophrenia frequently progresses in a step-like manner, each relapse meaning a further set back for the patient. Before we can come to a definite conclusion as to the value of a given method, we shall have to observe our patients for a long enough period of time to see what their subsequent behavior will be and how the patient will react in his adjustment in the outside world. Another point one might mention, particularly in reference to the series of cases that were not treated, is that these most probably were actually not treated. With the large number of patients in state hospitals and the comparatively small number of physicians available, a systematic, psychotherapeutic attempt is practically out of the question in the case of most patients. It would

compare these two groups with those reported by Ross, we see first of all that the figures for both groups treated psychotherapeutically are more or less alike. A comparison with the insulin treated patients shows no difference in complete recoveries, but a much higher degree of so-called "much improved" and "slightly improved" patients as compared with those treated by psychotherapy; but here again I want to mention that the insulin treated patients had been discharged comparatively recently. What the results will be after five or more years remains a question. In our own series as is seen in the table, we have tabulated the results in thirty-nine cases that were admitted to the hospital during 1936 with a follow-up period of from sixteen to twenty-eight months. In these, as can be seen, the patients found to be completely recovered comprise 31 per cent of the total and almost half of the cases show some form of improvement. It is logical to assume that with the passage of time the proportion will fall to the level of the older data.

In summing up the results as they are shown in the table, we could say that in general the patients treated psychotherapeutically have fared probably as well as those treated with insulin. Final comparisons, of course, cannot be made until the patients treated with insulin have been observed for a longer period of time. The patients treated with metrazol show a much lower percentage of good results and, as far as the New York State Hospital data is concerned, there does not seem to be any

reason for considering this method as producing anything more than a temporary relief.

In our opening remarks we mentioned that whatever the results of the "shock" methods may be in terms of therapeutic success, their introduction has helped to encourage the probing of new fields, particularly in the direction of pharmacotherapy. A number of such attempts have already been started and, although they are still in their experimental stages and the results obtained cannot be regarded as conclusive, they are distinctly worth while following up both for the therapeutic possibility and the light they may throw on the nature and etiology of the schizophrenic process. As an example we should like to mention briefly our own experiences with the use of intraspinal injections of mecholyl.

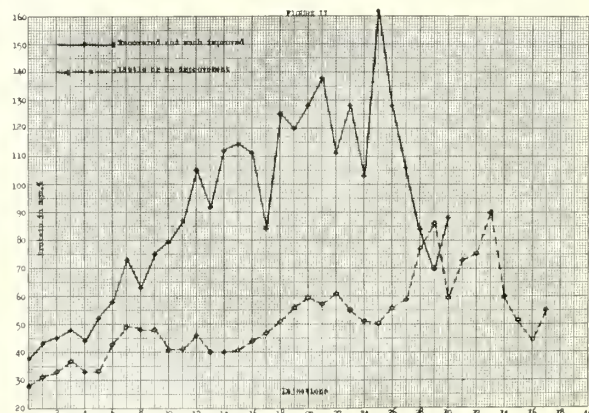
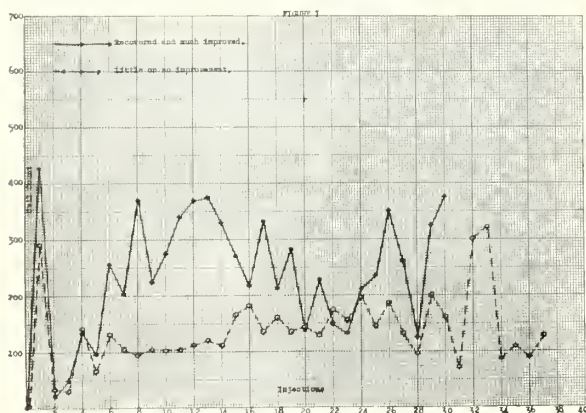
We cannot undertake a discussion of the possible relationships of this drug to the schizophrenic process, especially since the use of the drug at the Iowa State Psychopathic Hospital was not originally undertaken for therapeutic purposes. We have for some time been investigating the neurophysiological and psychopathological effects of certain drugs in mentally diseased persons and decided to include in this study the drugs related to the sympathetic and parasympathetic systems. In the case of the first we made use of adrenalin; in the second, however, we encountered some difficulty. Acetyl choline, which was the first one to suggest itself as a parasympathetic stimulant, is so quickly destroyed in the blood that the lack of results in terms of central nervous system effects may have been due to its rapid disappearance. Mecholyl,\* which is less easily destroyed by the blood esterases, also failed to produce much change in behavior, either when injected subcutaneously or intravenously. It was with this in mind that we decided to use it intrathecally. This served as the starting point in the experiment, but since the first few cases used in this investigation showed interesting changes in the clinical picture, we continued to use it as a possible therapeutic agent.

\*We wish to express our indebtedness to the Merck Company for supplying the drug and their generous help in giving us advice and information as to its use and function.

Up to the present date we have treated twenty-three schizophrenic patients in this way, the technique being as follows: Small doses of mecholyl (beginning with about .2 of a milligram in 1 cc. of distilled water) were injected into the spinal canal, the dosage being increased gradually depending upon the amount of reaction obtained. The highest dose given so far was 4.5 milligrams at a single injection. These injections were administered three times a week for a total of about twenty-five injections. The reactions to the injections of the drug can be grouped under three headings: changes in the cerebrospinal fluid, physiological effects and changes in the clinical picture. Since we are interested in this paper particularly in the possible therapeutic effects, we should like to restrict ourselves mainly to a description of these.

Of the twenty-three cases treated (see table 1) seven are at present back to their prepsychotic state, in other words, they show a complete recovery. Four show marked improvement although there is some persistence of pathological symptoms. They are, however, getting along well and may be considered as much improved. Four are at home but show a fairly definite degree of defect and are not capable of looking after themselves. These we consider as improved to a moderate extent. Again we must emphasize, as we did in the case of the patients treated by insulin or metrazol, that the period of follow-up is comparatively brief (the treatment was begun about two years ago), and therefore we cannot state definitely how many of these patients may suffer relapses in the future. There was no definite relationship between the results of the treatment and any of the diagnostic types of this disease, although we did notice that there was a slight preponderance of hebephreniac patients among those that showed recovery or much improvement. It is also of interest that in these patients we found quite frequently an initial aggravation of the symptoms with a development of acute excitement, rigidity and other catatonic manifestations.

A discussion of the neurophysiological effects and changes in the cerebrospinal fluid would take us too far afield. One of us is at present working





on a report to be published soon on this aspect of the investigation in relationship to the results obtained with other drugs. It might be of interest, however, to mention briefly some of the changes in the cerebrospinal fluid. In general they can be described as consisting of sterile meningitic reactions of varying degrees. There is an increase of cell count, protein and the permeability quotient. There are some indications, even in the small number of cases we have, of a relationship between the nature of this reaction and the therapeutic progress. Figures 1 and 2 show in the form of composite graphs the behavior of the cells and protein content.

In figure 1 the rise in cell count during the course of treatment is shown in the continuous line for the recovered and improved cases, whereas the interrupted line represents those with little or no improvement. It is quite clear that the first of these shows a stronger and earlier reaction than the second. The same is true of the protein as shown in figure 2. We do not feel justified at present in drawing any definite conclusion on the basis of these findings, but one could think of them as running parallel to the accentuated clinical picture and as, perhaps, representing a strong reaction of the organism to a disease which characteristically does not call forth any vigorous responses.

In summing up we can say that each one of the methods presented seems to be of definite therapeutic value, but none of them can be regarded as successful in all cases of schizophrenia. In our own work, when we compare the results of psychotherapy and mecholyol, we are impressed with the fact that these two methods seem to be most effective in different types of the disease. When one considers that schizophrenia as a whole most probably consists of types of reaction differing both in nature and etiology, it is logical to assume that the types of treatment applied will also have to be different. Further investigation and accumulation of data may determine whether this is true and, if so, what the indications for special types of treatment will be.

Iowa State Psychopathic Hospital.

#### BIBLIOGRAPHY

1. A comprehensive report of the development of the "shock" methods and the results up to the time of its publication is given in Supplement to the May issue of the *American Journal of Psychiatry*, 94 (May) 1938.
2. May, J. V.: The Dementia Praecox—Schizophrenia Problem, *Am. J. Psychiat.* 11 (November) 1931.
3. Bleuler, E.: *Dementia Praecox oder die Gruppe der Schizophrenien*, Deuticke, Leipzig, 1911.
4. Meyer, Adolf: Fundamental Conception of Dementia Praecox, *Brit. M. J.* (September) 1906.
5. Schilder, Paul: *Psychotherapy*, W. W. Norton, New York, 1938.
6. Malamud, William, and Miller, W. R.: Psychotherapy of the Schizophrenias, *Am. J. Psychiat.* 11 (November) 1931.
7. Ross, John R.: The Pharmacological Shock Treatment of Schizophrenia, *Am. J. Psychiat.* 95 (January) 1939.
8. Cheney, C. O., and Drewry, P. H.: Results of Non-specific Treatment in Dementia Praecox, *Am. J. Psychiat.* 95 (July) 1938.
9. Malamud, William, and Render, N.: Course and Prognosis in Schizophrenia, *Am. J. Psychiat.* 95 (March) 1939.

## 1937 ST. LOUIS EPIDEMIC OF ENCEPHALITIS

### FOLLOW-UP STUDIES

ANDREW B. JONES, M.D.

AND

GEORGE S. BOZALIS, M.D.

ST. LOUIS

One year after the second outbreak of epidemic encephalitis in St. Louis we attempted to reexamine the survivors of the epidemic who had been treated at Isolation Hospital during the summer and fall of 1937.

The total number of cases treated was 134.<sup>1</sup> There were thirty deaths in the hospital; 104 patients were discharged or transferred to other in-

Table 1. Patients Examined According to Age

Age	Number
0-5	3
5-10	6
10-20	8
20-30	12
30-40	6
40-50	7
50-60	14
60-70	18
70-80	2
80-up	1
Total	77

Five patients expired since discharge; three females aged 75, 65, 63; two males aged 55 (lymphatic leukemia), aged 76 (infirmities of the aged).

stitutions. Of this number eighty-two were found or accounted for (table 1); five had died; seventy-seven reported for interviews and were examined.

Of the seventy-seven cases examined, fifty-nine stated they were perfectly well and free of symptoms (table 2) although some of these had changes in or absence of some of the reflexes (table 3).

Table 2. Patients Entirely Normal at Present Time

Age	Number of Patients
0-5	1
5-10	6
10-20	4
20-30	8
30-40	5
40-50	6
50-60	11
60-70	16
70-80	2
80-up	0
Total	59

Twenty-one of the fifty-nine who claimed to be perfectly well had had subjective symptoms of one sort or another for as long as six months after discharge from the hospital (table 4).

Eighteen of the seventy-seven cases examined were still complaining of some difficulty (table 5).

The nineteen cases that were discharged from the hospital with some residual symptoms<sup>2</sup> were found and examined or had died. Eleven of them are now normal and without complaints. Three had died. Reports on the three who died follow.

C. S. Female, aged 75, died of cardiac decompensation at City Hospital on October 14, 1937, twenty-seven days after discharge.

Table 3. *Neurological Findings*

Reflex Involved	Number of Patients
All physiological	32
Abdominals absent	7
Right upper quadrant absent	8
Left upper quadrant absent	7
Left lower quadrant absent	2
Right lower quadrant absent	2
Abdominals sluggish	6
Cremasters sluggish	3
Ankle jerks sluggish	12
Knee jerks sluggish	6
Tremors of hand	1
Muscle atrophy	2
Ankle jerks absent	7
Cremasters absent	4
Hyperactive reflexes	3
Knee jerks absent	3
Right cremaster absent	1
Pupils dilated and fixed (serology negative)	1
Absence of smell	1
Left biceps absent	1
Left triceps absent	1
Biceps sluggish	3
Triceps sluggish	3
Poor hearing, left	1
Unsustained ankle clonus, bilateral	1

Table 4. *Subjective Symptoms 6 Months or Less Following Epidemic Encephalitis*

Symptoms	Duration in Months	Number of Patients
1. Tremendous appetite	1 to 3	3
2. Night jerkings before, none since		1
3. Weight gain, 30 lbs.		1
4. Jerking during sleep, mild	1 to 3	2
5. Making better grades		1
6. Incontinence	2 to 6	3
7. Dizziness on movements of head	5	1
8. Poor memory	1 to 6	3
9. Mental dullness	1 to 6	3
10. Blurry vision	2 to 4	1
11. Tremors	1 to 4	4
12. More irritable	2 to 3	3
13. Muscle weakness	1 to 6	3
14. Fewer headaches		1
15. Psychosis	1 week to 1	3
16. Headaches before, none since		1
17. Auditory buzzing	6	1

Table 5. *Complaints According to Age*

Age	Number of Patients	Complaints
1-5	1	Weak left arm and leg.
5-10	0	
10-20	4	(1) Weak right leg; (2) poor school work since, poor vision; (3) backache and headache; (4) astigmatic, jerking at night, personality changes.
20-30	5	(1) Irritable, poor memory; (2) poor memory, severe headaches; (3) jerking at night while asleep; (4) poor hearing, left, tremors of hands, tongue and lips, easily excited; (5) irritable, headaches weeks at a time, poor memory
30-40	1	Persecutory ideas.
40-50	1	Irritable, poor vision.
50-60	3	(1) Irritable, poor memory; (2) excessive sweating, dull pain in base of occiput, continuous sudden fatigue following meals; (3) headaches on exertion.
60-70	2	(1) Headaches, occipital, on fatigue; (2) irritable.
70-80	0	
80 up	1	Loss of smell.
Total	18	

L. G. Female, aged 63, was transferred to City Hospital after isolation period in a lethargic state and with urinary retention and died October 31, 1937, twenty-four days after transfer.

J. B. Male, aged 76, died at his home of infirmities of the aged on September 22, 1937, fourteen days after discharge.

Reports on the five patients who retained residual symptoms or complaints follow.

C. E. Male, aged 81, is clear mentally but has loss of sense of smell.

S. B. Male, aged 11, has marked personality changes and jerking in sleep. Had strabismus when discharged but this has disappeared.

E. J. Female, aged 22, is irritable and has poor memory.

N. T. Male, aged 26, was mentally dull for one month. Has tremor of tongue, lips and outstretched fingers; bilateral unsustained ankle clonus; greatly exaggerated tendon jerks; impaired hearing in left ear.

R. G. Male, aged 18 months, has paralysis of left arm and left leg with muscle atrophy.

Thirteen patients who were discharged from the hospital as well were found to have the complaints listed in table 6. These, with the five of the original nineteen who were discharged with residual symp-

Table 6. *Complaints According to Age in Patients Discharged as Well*

Age	Number of Patients	Complaints
0-5	0	
5-10	0	
10-20	3	(1) Weak right leg; (2) poor school work since, poor vision; (3) backache and headache.
20-30	3	(1) Poor memory, severe headaches; (2) jerking at night while asleep; (3) irritable, headaches weeks at a time, poor memory.
30-40	1	Persecutory ideas.
40-50	1	Irritable, poor vision.
50-60	3	(1) Irritable, poor memory; (2) excessive sweating, dull pain in base of occiput, continuous sudden fatigue following meals; (3) headaches on exertion.
60-70	2	(1) Occipital headaches on fatigue; (2) irritable.
70-80	0	
Total	13	

toms, make a total of eighteen cases, or 23+ per cent of the seventy-seven survivors examined who now have some residual symptom or complaint other than reflex changes.

In table 7 are listed, according to age, the neurological residual symptoms found at this time.

Table 7. *Ages in Which Reflexes Are Absent or Sluggish*

Age	Number of Patients
0-5	4
5-10	1
10-20	1
20-30	0
30-40	2
40-50	2
50-60	9
60-70	9
70-80	0
80 up	1
Total	29

## COMMENTS

It is impossible to contrast these studies with the reports of Bredeck et al.,<sup>2</sup> and Hempelmann,<sup>3</sup> in their follow-up studies of the 1933 outbreak in St. Louis. They have analyzed a large series of cases but it is not clearly stated how many cases they examined or whether their data were based



upon the information contained in answers to questionnaires.

Presumably Hempelmann's studies<sup>3</sup> were a continuation of those published by Bredeck et al.<sup>2</sup> Hempelmann's conclusions were: (1) That sequelae were conspicuous by their absence; (2) no Parkinsonism found but 11 per cent had some form of tremor for varying periods; (3) actual organic residual symptom (type unstated) in 5.7 per cent of cases; (4) 42 per cent had no complaints, an equal number reported subjective nervous symptoms; (5) changes found in the physical examination could easily be explained by age rather than by encephalitic changes.

Our studies show that there were definite organic residual symptoms in twelve patients, all less than 50 years of age as shown in table 5. Our figures are given only on cases examined. Reference to the various tables shows that residual symptoms occur in nearly all the age groups, the greatest number being in the age group below 50, the inference being that the findings cannot be explained upon the basis of age.

#### SUMMARY

Of the seventy-seven cases examined 76.6 per cent showed a complete recovery.

Of the eighteen cases, 23.4 per cent, who had some residual complaint or neurological findings, all have resumed their old occupation or place in the community. In this group are two children, aged 30 months and 10 years, who have atrophy of one or more muscle groups. Unquestionably these were erroneously diagnosed as epidemic encephalitis. Therefore, a corrected figure for the residual symptoms should read 21+ per cent.

Attention is called to the diverse or protean nature of the residual symptoms and signs. These are in keeping with the signs and symptoms present in the acute phase of the illness.

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#### BIBLIOGRAPHY

1. Bozalis, G. S., and Jones, A. B.: Epidemic Encephalitis, St. Louis Type, Survey of Outbreak, Summer and Fall of 1937, J. Oklahoma M. A. (May) 1938.
2. Bredeck et al.: Follow-up Studies of the 1933 St. Louis Epidemic of Encephalitis, J. A. M. A. 111:15-17 (July 2) 1938.
3. Hempelmann, T. C.: Acute Epidemic Encephalitis in St. Louis, J. Pediat. (November) 1938.

This survey was made with cooperation of the St. Louis Encephalitis Commission.

## TRAUMATIC CONSTRICTIVE PERICARDITIS

E. E. GLENN, M.D.

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Constrictive pericarditis or chronic compression of the heart has become a rather well recognized clinical entity. Sprague<sup>1</sup> has described the signs of constrictive pericarditis and has discussed the differential diagnosis between this condition and congestive failure. He states that the diagnosis is made by noting, usually in a young person, the inconsistency between the finding of cyanosis, persistent venous distention, ascites, edema and enlarged liver and the absence of orthopnea, cardiac enlargement and signs of valvular disease. He states further that the low blood and pulse pressure, paradoxical pulse, limited cardiac excursion or calcification of the pericardium by roentgenogram and low voltage or T wave inversion in the electrocardiogram may be helpful in making the diagnosis. Beck<sup>2</sup> states that the following diagnostic triad is present when there is chronic compression of the heart: (1) a small quiet heart, (2) a high venous pressure, and (3) ascites and enlargement of the liver. The roentgen ray diagnosis of cardiac compression due to pericardial scar has been described by Freedman.<sup>3</sup> He says that pericardial calcification is the most conclusive sign. If this sign is absent, he states, one is justified in making an unequivocal diagnosis of constrictive pericarditis only if several other individual signs are present such as a small heart that shows little movement and shows no change in position with different phases of respiration and different positions of the body. He considers the roentgenoscopic examination of more importance in this regard than the roentgenographic, although the roentgenkymograph is helpful in determining the degree of movement of the heart borders with cardiac pulsations. The electrocardiographic findings in constrictive pericarditis have been described by Sprague,<sup>1</sup> Beck,<sup>4</sup> White<sup>5</sup> and others. The abnormalities most often present are low voltage, slurring of QRS complexes and inverted or iso-electric T waves.

In many instances, a consideration of these signs makes the diagnosis of constrictive pericarditis comparatively easy and conclusive. However, in many cases, some of the diagnostic signs are difficult to elicit and others may be caused by other conditions. For example, it may be difficult to determine if the heart is small because of a contracted pericardial sac or, if it is a normal sized heart for the patient being examined, has failed and has not yet shown any marked dilatation or hypertrophy. Cases like this have been seen where the heart has failed as a result of coronary thrombosis. The size of the heart may be difficult to determine because of hydrothorax or thickened pleura. Because of past pleural disease, the heart may be fixed so it does not move with respiration or when

The mortality rate in cases of acute perforation of peptic ulcer is lowest when operation is performed within six hours of the perforation, Harold Lincoln Thompson, M.D., Los Angeles, states in *The Journal of the American Medical Association* for Dec. 2.

The mortality rate was 21.5 per cent in 130 cases operated on within six hours of the perforation, 22 per cent in 168, 46.2 per cent in fifty-four and 34.2 per cent in seventy-three cases operated on within twelve, twenty-four and more than twenty-four hours, respectively. Spinal anesthesia also played a part in lowering the mortality rate.

the position of the patient is changed. The low blood and pulse pressure and the enlarged liver, ascites and edema may be due to congestive failure. We should be reluctant to make a diagnosis of constrictive pericarditis in the middle aged and older patients because the condition usually manifests itself while the patient is still young.

The etiology of chronic constrictive pericarditis is usually difficult to determine. Levine<sup>6</sup> states that the development of the condition is meagerly understood but that it is fair to assume that it occurs as a result of either a single or repeated infection of the pericardium such as acute rheumatic fever, pneumonia or tuberculosis. A review of the literature at hand indicates that constrictive pericarditis has not often been found to result from trauma. White<sup>7</sup> states that trauma resulting in hemopericardium may leave constrictive pericarditis. Beck<sup>2</sup> states that the heart can be compressed or partly strangulated through a traumatic rupture of the parietal pericardium. The compression scars may be localized or generalized over the entire heart. The following case is reported in detail because of trauma being definitely proven to be the etiological factor.

#### CASE REPORT

F. E. G., aged 46, salesman, gave a history of having had most of the usual childhood diseases without complications. He had an attack of pneumonia in 1928 which was not severe and from which he made a complete and uneventful recovery. He was in perfect health in April 1935 when he was seriously injured in an automobile wreck. He was taken to St. John's Hospital on the surgical service of Dr. T. E. Ferrell. Dr. Ferrell found the patient to be in severe shock and to have a crushing injury to his chest. The lower costal cartilages on the right were separated from the sternum and the fifth rib on the right was fractured a short distance from its anterior end. The right lower chest wall was depressed as could be determined by inspection and palpation. He developed a pneumonia and was placed in an oxygen tent. His abdomen was distended and he became jaundiced. After a few days he began to improve and after four weeks he was able to sit up in a chair. Ten days later he was discharged from the hospital. He returned to work after a few months and remained in fairly good health until the onset of the present illness except that he was dyspneic to some extent on exertion. The dyspnea became more severe about April 1, 1937. Somewhat later, he began to be nauseated and his abdomen

often would be distended. On June 1, 1937, he had severe precordial pain which radiated to the left shoulder. He was first seen during this illness by Dr. Ferrell on June 6, 1937, at which time his pulse was almost imperceptible. His systolic blood pressure was 92 mm. Hg. and his pulse pressure was very low. His pulse was definitely paradoxical at that time. He was dyspneic and had a rather severe cough. There was evidence of pulmonary congestion. With bed rest and digitalization he began to improve so that he could be taken to St. John's Hospital on June 29, 1937, at which time I first saw him in consultation with Dr. Ferrell. At this time, he complained chiefly of nausea and gaseous distension. His respirations were slightly labored and 30 per minute. He was moderately orthopneic. A slight but definite jaundice was present. The radial pulse was soft and weaker during inspiration. The radial and retinal arteries did not appear to be sclerotic. The body temperature was normal and the pulse rate was 84. The apex impulse could not be seen and could not be definitely localized by palpation. The area of precordial dulness was not enlarged. The heart borders were normal in contour when the hypersthenic build of the patient was considered. The rhythm was normal. The heart sounds were distant but it was thought this was because of the thickness of the chest wall. No murmurs were present. The blood pressure was 106 mm. Hg. systolic and 80 mm. Hg. diastolic and varied with respiration so as to confirm the impression that the pulse was paradoxical. No persistent moist rales were present in the lungs and there was no impairment of resonance. The breath sounds were harsh. The liver was palpable 4 cm. below the costal margin, but was only slightly tender. The abdomen was moderately distended and the presence of fluid was suspected in the peritoneal cavity. The red blood count was 5 million and the hemoglobin 85 per cent. The white blood count was 14,500 with 85 per cent polymorphonuclears at time of admission to the hospital, but ten days later it was 8,600 with 79 per cent polymorphonuclears. Urine was normal except for one plus albumin. The electrocardiogram (fig. 1) showed the P-R interval to be .26 second with low voltage of QRS complexes. Right axis deviation was present. The T wave in lead 1 was diphasic and T2 and T3 were inverted. No Q wave was present in lead 4 (apex and left leg). Eight days later there was a decided change in the electrocardiogram. There was less prolongation of the P-R interval and the axis deviation was now normal. Lead 4 showed a large Q wave and an upright T wave. The prolongation of the P-R interval in the tracing made June 29, 1935, may have been due in part to digitalis which the patient had been receiving but which was discontinued when he entered the hospital. However, the changes which had occurred when the electrocardiogram was repeated July 7, 1937, could not all be explained by the effect of the digitalis becoming less.

The symptoms and signs enumerated were compatible with the diagnosis of coronary thrombosis. After keeping him in bed for several weeks, he was gradually allowed to get up and walk some. On August 25, 1937, a pleural rub was heard in the right lower chest posteriorly but no pain was present. The pleural rub persisted, and three days later there was physical and roentgen evidence of fluid in the right pleural cavity. A few days later edema of the ankles was noticeable although he had been on his feet very little. At this time the patient was again digitalized but the peripheral edema continued to increase and the liver extended down further below the costal margin. The amount of fluid in the pleural cavity also increased and fluid in the peritoneal cavity could be demonstrated definitely. Ammonium chloride was given for three days and followed by a mercurin suppository. Diuresis was moderate with some decrease in the ascites and peripheral edema but there was no apparent decrease in the

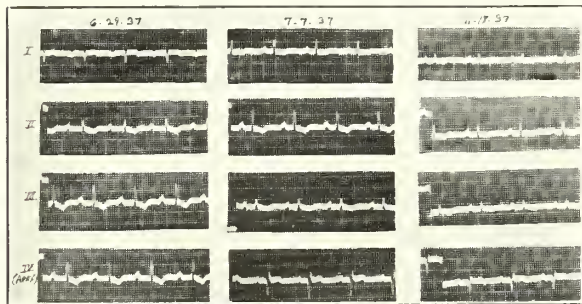


Fig. 1. Electrocardiogram made June 29, 1937, shows prolonged P-R interval (.26 sec.), probably due in part to digitalis; left axis deviation. On July 7, 1937, axis deviation normal. On November 18, 1937, voltage shows a further decrease. Note inverted or diphasic T waves in all regular leads on all three dates.



amount of fluid in the pleural cavity. The ammonium chloride and mercurin were given weekly for three weeks with an average loss of three pounds in weight because of the diuresis. On October 8, 1937, 1,200 cc. of straw colored fluid was removed from the right pleural cavity which had a specific gravity of 1.011 and contained a few round cells but no bacteria.

The heart findings remained about the same. The heart was not enlarged and the paradoxical pulse continued to be present. Even though the lung volume and vital capacity were decreased because of the pleural fluid, the patient was only slightly dyspneic and orthopnea was less noticeable. During the next month the ascites and edema of the legs would increase as soon as he was allowed out of bed although ammonium chloride and mercurin were given weekly. The fluid continued to collect in the right pleural cavity, and from 1,000 cc. to 1,500 cc. of fluid were removed every seven to ten days. The venous pressure measured 20 cm. of water. The heart remained the same without any increase in size and the paradoxical pulse was still evident. Pericarditis with adhesions preventing filling of the heart would explain all the symptoms present at this time. Roentgen ray examination of the chest at onset of the pleurisy showed the heart to be within normal limits as to size and shape (fig. 2). Fluoroscopic examination showed no indication of cardiac enlargement but the heart movement was difficult to demonstrate. Electrocardiographic findings on November 18, 1937, were about the same as they were on July 7, 1937, except a further decrease in voltage was shown (fig. 1). Pericarditis with acute inflammatory changes or with effusion would also explain the electrocardiographic findings present soon after onset. The patient was much older than is usually the case when the symptoms caused by constrictive pericarditis first appear. It will be remembered that the patient suffered a crushing injury of his chest two years before onset of present illness and this injury was considered the probable cause of adhesions developing in and around the pericardial sac which would interfere with the filling of the heart.

A roentgenkymograph\* was made which did not lend much support to the diagnosis of constrictive pericarditis. It showed a decrease in the amplitude of move-

ments of the left ventricle, especially in the lower third, which suggested an infarct (fig. 3). Because of this we felt less certain that constrictive pericarditis was the correct diagnosis. The fluid continued to collect in the right pleural cavity but not so rapidly as before. The edema of his legs continued and his abdomen showed further enlargement; also the liver extended down further below the costal margin. Although marked diuresis was obtained with mercurial diuretics intravenously, the abdomen continued to enlarge with quite definite evidence of ascites. An abdominal paracentesis was done first on February 11, 1938, and 3,000 cc. of bile tinged fluid was obtained which had a specific gravity of 1.012. After removal of the fluid, the liver could be palpated easily and its surface and borders seemed irregular so that carcinoma was strongly suspected. The ascites and peripheral edema continued to appear so that repeated abdominal paracentesis and the use of salyrgan or mercurin intravenously continued to be necessary. Almost all of the fluid intake could be accounted for by the amount of fluid obtained by paracentesis and the amount of urine passed following the injection of diuretics. After the abdominal fluid began to form so rapidly the fluid in the pleural cavity collected less rapidly so that its removal was seldom necessary.

The patient's strength was lessening and it was quite evident that he could not survive much longer if some relief could not be given. His condition was discussed with Dr. Ferrell and an exploratory laparotomy decided upon with the thought that if no malignancy was present some relief might be given from the rapid formation of ascites by an omentopexy. For this reason, the patient was readmitted to the hospital September 13, 1937, and the operation performed by Dr. Ferrell two days later under spinal anesthesia. A high right rectus incision was made and between 6,000 cc. and 7,000 cc. of transparent bile tinged fluid was found in the peritoneal cavity. The liver was found to be about twice normal size and showed no evidence of malignancy. A biopsy specimen was taken from the margin of the liver and examined by Dr. Murray C. Stone. It showed chronic passive congestion. The gallbladder was white, tense and surrounded by numerous adhesions. It was aspirated and clear mucilaginous fluid obtained. The

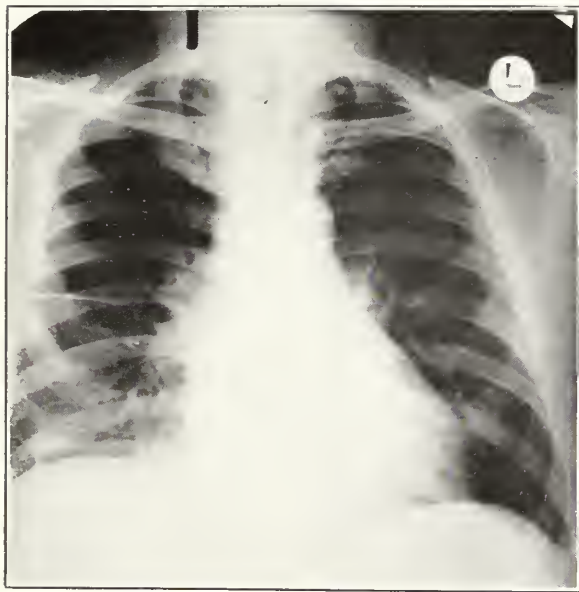


Fig. 2. Roentgenogram made August 25, 1937. Heart normal in size and outline.



Fig. 3. Roentgenkymogram shows lack of movement in lower third of left ventricular margin. Density in medial portion of right lung field due to an atelectatic lower lobe.

\*Roentgenkymograph made by the Edw. Mallinckrodt Institute of Radiology, Washington University, St. Louis.

spleen was twice normal size but smooth and regular in outline. No mesenteric lymph glands were palpable. An omentopexy was performed on the left side after the method of Talna using Schiassi's technic except that the spleen was not fixed to the abdominal wall. A drain was inserted through the lower angle of the right rectus incision.

Following the operation, there was considerable drainage of ascitic fluid for a few days but this gradually decreased in amount. The patient was discharged from the hospital a month after the operation and was able to be out of bed for short intervals. After the abdominal wound ceased draining, the ascites recurred so that paracentesis was necessary several times but not so frequently as before the operation. He became more dyspneic the first of December, 1938. The chest was aspirated and 500 cc. of yellowish pus was obtained. The dyspnea was not relieved by the removal of the pus and the peripheral edema increased. During the afternoon of December 15, 1938, he began to expectorate yellowish pus and died a few hours later.

#### AUTOPSY REPORT

Autopsy was performed by Dr. Murray C. Stone. The body was edematous and the skin showed a marked degree of jaundice. The sternal ends of the sixth and seventh costal cartilages on the right overlapped the posterior surface of the right sternal border in such a manner that a hard mass 2.5 centimeters thick was formed on the posterior surface of the sternum. The two layers of the pericardium were densely adhered except at the extreme apex of the heart. A thick fibrous band extended from the right side of the pericardial sac to the point where the lower part of the right lung was adhered to the diaphragm. This was posterior to where the lung was adhered to the sixth and seventh costal cartilages and where the hardened mass at the right sternal border pressed backward. The inferior vena cava passed through this point and its lumen was greatly reduced. The right diaphragm was displaced upward. The right lung was adhered to the pericardium. Approximately 500 cc. of greenish yellow pus was found in the right pleural cavity. This was confined to the lower and posterior portion of the pleural cavity by adhesions between the lung and parietal pleura. The right lung was normal except for its lower portion being compressed. In the left pleural cavity 300 cc. of transparent yellowish fluid was found. Except for this the left lung was normal. The coronary arteries were normal throughout and the heart muscle was normal except for the adherent pericardium (fig. 4). The heart valves were normal except for some thickening and roughening of the mitral cusps.

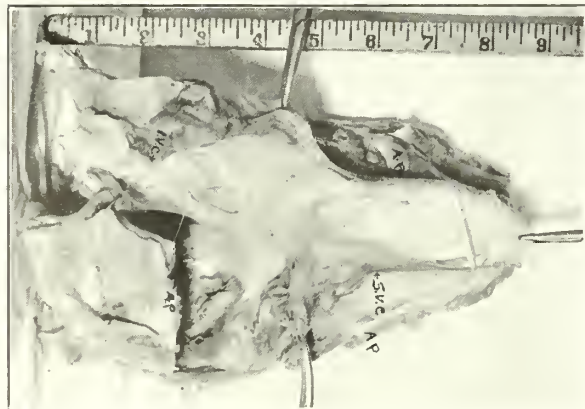


Fig. 4. Autopsy specimen showing thickened adhered pericardium, A. P., with the right auricle laid open. Inferior vena cava, i. v. c., with constriction at point lettered. Superior vena cava, s. v. c. Note size of inferior vena cava compared with the superior vena cava.

On opening the abdomen a considerable amount of transparent yellowish fluid escaped. The edge of the omentum was firmly adhered along the border of the right rectus. The omentum was firmly embedded between the peritoneum and the posterior rectus fascia corresponding to the external scar over the left rectus made when the omentopexy was performed. The lower border of the liver was at the costal margin. There were numerous adhesions between the liver, gallbladder, stomach and the hepatic flexure of the colon. The cystic duct was obliterated and the gallbladder contained a single white soft concretion. The liver was small and pale and its edges were rounded. The cut surface was finely granular and its consistency slightly increased. The spleen, pancreas and kidneys were grossly negative.

#### DISCUSSION

Some interesting diagnostic difficulties were present throughout the clinical course of this case. In retrospect, it seems quite evident that pericardial injury occurred at the time of the automobile accident in April 1935. It seems likely that hemorrhage occurred into the pericardial cavity that resulted in adhesions. This occurrence is mentioned as a possibility by White.<sup>7</sup> The adhesions probably did not greatly interfere with filling of the heart until the spring of 1937. At this time, contraction of adhesions may have interfered especially with filling of the left auricle as the symptoms at first were those of failure of the left side of the heart. It is impossible to determine what happened in June 1937 which caused changes like those caused by acute coronary thrombosis. One possibility is that the pericardial sac was not completely obliterated at that time and that acute inflammatory changes occurred in the pericardium which caused the elevation of temperature, the leukocytosis and the electrocardiographic changes. The later development of the pleural rub followed by pleural effusion suggests that there may have been an acute inflammatory change in the pleura also. After the acute inflammation subsided, there seems to have been a further contraction of adhesions that interfered especially with filling of the right side of the heart resulting in enlargement of the liver, ascites and edema of the lower extremities. It seems possible that the obstruction of the inferior vena cava by the scars posterior to the right sternal border may have been of great importance at this time.

This case shows that Beck's<sup>2</sup> diagnostic triad, although eventually demonstrated, may be difficult to evaluate. In this case no cardiac enlargement was present but, as is well known, coronary thrombosis may be present in a small quiet heart. An actual decrease in cardiac movements was difficult to determine, especially after the pleural fluid appeared on the right. One could be rather certain that there was a decrease in the movements of the left cardiac border. The position of the heart was constant in spite of change in position of the patient, but the pleural adhesions associated with the presence of fluid in the pericardial cavity could explain this. The roentgenkymogram showed lack of movement of the lower third of the left ventricle which is more characteristic of a myocardial infarct than



it is of any other condition. The high venous pressure was considered at first to be due to myocardial failure which was caused by myocardial infarction. At first the liver enlargement was slight and ascites could not be definitely demonstrated. The findings that seemed to point toward a diagnosis of constrictive pericarditis most constantly were: (1) the paradoxical pulse which was present constantly, together with a low systolic blood and pulse pressure, (2) elevated venous pressure, and (3) the electrocardiographic findings of low voltage and inverted T waves. When the possibility of constrictive pericarditis was first thought of, it seemed unlikely because of the age of the patient. It seemed that if constrictive pericarditis was present that it should have caused symptoms before the patient had attained the age of 46 years. The crushing injury to his chest that occurred two years before was then remembered and a consideration of the symptoms at that time indicated that this might well have been the cause of the adhesions developing. It was of considerable medico-legal importance to show that the patient's death was due to the automobile accident that occurred two years before the onset of his last illness.

#### SUMMARY

1. A case of constrictive pericarditis is reported which resulted from a crushing chest injury two years before onset of the fatal illness.

2. The difficulties encountered in arriving at the correct diagnosis are discussed.

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#### BIBLIOGRAPHY

1. Sprague, H. B.: Differential Diagnosis of Congestive Heart Failure and Constrictive Pericarditis, *Am. Heart J.* 12:443-447 (October) 1936.
2. Beck, C. S.: Acute and Chronic Compression of the Heart, *Am. Heart J.* 14:515-525 (November) 1937.
3. Freedman, E.: Roentgenologic Diagnosis of Cardiac Compression Due to Pericardial Scar, *Am. J. Roentgenol.* 37:739-759 (June) 1937.
4. Beck, C. S., and Cushing, E. H.: Circulatory Stasis of Intrapericardial Origin; Clinical and Surgical Aspects of the Pick Syndrome, *J. A. M. A.* 102:1543-1548 (May 12) 1934.
5. White, P. D.: Heart Disease, 2nd ed., p. 479, The Macmillan Co., 1937.
6. Levine, S. A.: Clinical Heart Disease, p. 95, W. B. Saunders Co., 1936.
7. White, P. D.: Heart Disease, 2nd ed., p. 474, The Macmillan Co., 1937.

#### TEACHERS WHO ATTEND SCHOOL WHEN ILL ENDANGER HEALTH OF PUPILS

"Teachers are often at school when, for the health of all concerned, they should be at home," James Frederick Rogers, M.D., Washington, D. C., points out in the December issue of *Hygeia, The Health Magazine*.

"The teacher's leave of absence on account of illness should be liberal and cumulative. The teacher who has to give up part of her too often inadequate wages for payment of the substitute teacher's work is prone to 'stick it out' as long as she can. This is of course a dangerous procedure, both for the teacher herself and for the pupils whom she is exposing to her illness. Normal health is an essential for fitness for the work of teaching, especially in respect to that fundamental for teaching—the ability to manage pupils."

## MODERN TREATMENT OF PNEUMONIA

WITH DISCUSSION OF ATYPICAL TYPES

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#### NONPNEUMOCOCCUS INFECTIONS

Among the latest compounds of sulfanilamide which have achieved therapeutic significance in the treatment of respiratory infections during the last year are neoprontosil and sulfapyridine. Current observation would seem to indicate that neoprontosil is as active in equal dosage as sulfanilamide and less toxic, grain for grain. Rosenthal<sup>1</sup> showed that the therapeutic effect of neoprontosil when given orally is probably greater than when given parenterally because of its slower renal elimination with the oral method. I have used oral neoprontosil routinely in pneumonitis and bronchopneumonia during the last winter when sputum examination revealed the streptococcus to be the predominant organism. In order to exclude the possibility of an early atypical pneumococcus pneumonia being obscured in its early stages, the physical, sputum and sometimes roentgen ray findings were checked daily. If a patient happens to harbor a higher type of pneumococcus, a nonpneumococcus influenzal pneumonitis or bronchial pneumonia may be mistaken for and treated as a higher type of pneumococcus pneumonia unless carefully differentiated by the mode of onset, the clinical course, the nature of the physical findings and the blood picture. This problem has presented itself not infrequently in my consultant practice.

Neoprontosil also has been used routinely in streptococcus throat infections coming on my hospital service. It seemed apparent that there were fewer toxic reactions than one had been accustomed to encounter with sulfanilamide. I have seen no instance of hemolytic anemia or agranulocytosis following the use of neoprontosil in the pulmonary and throat infections described, although they have been reported and must be carefully watched for. Because of its generally less toxic manifestations, neoprontosil is usually fairly well tolerated and may be tried in cases which have proved intolerant to sulfanilamide. I have encountered a few mild toxic effects somewhat similar to sulfanilamide reactions such as headache, dizziness, lassitude, nausea and vomiting and an occasional minor degree of cyanosis. The latter complication is controlled usually by giving a 2 grain capsule of methylene blue three times daily. Mild fever and acidosis occasionally may follow the use of the drug. Neoprontosil imparts a reddish tint to the urine and even to the skin, especially in blond types, more particularly when it is given parenterally. The oral dose of the drug ranges from 0.6 to 1 gram (10 to 15 grains) every four to six hours or a total of from 4 to 6 grams a day de-

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pending upon the severity of the infection, the age and weight of the patient and the tolerance to the drug. Where neoprontosil is not tolerated by mouth, I have used it per rectum by dissolving 3 grams (nine 5 grain tablets) in 100 cc. of saline solution and giving the solution two or three times daily. The binding substance in the tablets is insoluble and falls to the bottom of the solution, and is decanted off.

#### PNEUMOCOCCUS PNEUMONIA

Recent developments in pneumococcus pneumonia therapy have been dramatically significant. Present day therapy has at its disposal specific type serum therapy and sulfapyridine. Other therapeutic advances in the treatment of pneumonia include the early use of oxygen in toxic cases, either by nasal catheter or tent depending upon the degree of oxygen needed; the use of intravenous sucrose for pulmonary edema; provision for supplementing salt and vitamin C intake, and the proper interpretation and treatment of circulatory failure when it occurs, as an expression of peripheral vasomotor collapse rather than myocardial failure in most instances. Actual heart failure as a terminal factor in pneumonia fatalities is rarely seen unless there has been a history of antecedent cardiac disability, or when some objective evidence of cardiac damage is present, such as significant valvular lesions, auricular fibrillation, gallop rhythm or electrocardiographic evidence of significant myocardial damage or acute coronary pathology.

#### SERUM THERAPY

The use of specific type sera which are now available for all of the thirty types of pneumococcal pneumonia which has proven so successful in lowering the death rate needs little amplification except to emphasize the importance of prompt sputum typing and routine blood culture, the proper investigation of serum sensitiveness and adequate dosage (80,000 to 200,000 units) depending upon the day in the course of the disease, the presence of bacteremia, the response and age of the patient and the number of lobes involved. The initial test dose of 20,000 units is usually given intravenously although the intramuscular route is preferable for the first dose in the extremely sick, toxic patient. The balance is given intravenously two hours later or 20,000 units every two hours until the full complement has been given. Details of the indications for the serum with sulfapyridine are discussed later.

#### SULFAPYRIDINE THERAPY

Current reports upon the remarkable effectiveness of sulfapyridine in lowering the mortality rate of pneumococcus pneumonia give ample justification to the mounting enthusiasm this type of chemotherapy has evoked. Furthermore, the relative simplicity of its application, providing it is administered correctly and properly controlled, with all its potential toxic effects, complications and indica-

tions for abrupt cessation constantly kept in mind, as compared with the relatively greater technical difficulties associated with serum therapy with its greater expense, frequent inavailability and the many types that must be accurately determined and specifically applied, renders this new specific drug one of the outstanding therapeutic achievements of all time. The special report of the Council on Pharmacy and Chemistry of the American Medical Association<sup>2</sup> published May 6, 1939, states that "while there is much to be learned about the exact place of sulfapyridine in the treatment of pneumonia, it appears to be a useful measure in many cases when properly applied." The Council accepted the drug for inclusion in the New and Non-Official Remedies, advocating caution in its use and emphasizing the continued indication for typing of pneumonia cases not only for statistical purposes but for the immediately practical reason that the drug may prove ineffective or have to be discontinued and be replaced by serum therapy. Perhaps the circumstances attendant to the case may make combination drug and serum therapy advisable. As to sulfapyridine interfering with the capsule of the pneumococcus and consequently with typing, Plummer and Ensworth<sup>3</sup> report that they have not been able to confirm this warning. In a series of seventy-five retyped cases capsular swelling occurred whenever pneumococci were present even after as much as 40 grams of the drug had been given. Nevertheless, it is not only important to type the sputum as soon as obtainable in every case but also to repeat the typing in the event that proper response to therapy is not obtained or when there is evidence of reinfection, as the bacterial flora in the sputum sometimes changes during the course of pneumonia whether specific treatment is given or not.

The chemotherapeutic action of the drug seems to be a bacteriostatic effect upon the pneumococcus, that is, sulfapyridine injures the pneumococcus or perhaps acts as a barrier between the pneumococcus and the tissues, whereas, serum fortifies the pneumonia patient by enhancing his immunity and giving him a specific substance to neutralize the toxins of the pneumococcus.

I have adopted the following rules of procedure which seem justified by the present state of our knowledge concerning sulfapyridine therapy:

1. Sulfapyridine therapy should be started promptly as soon as the clinical picture of pneumonia is presented, even if atypical, or preclinically in its earliest expression. It is probably better to err on the side of over zealousness in anticipating pneumonia than to lose a few hours or perhaps a day or two waiting for the complete and unmistakable expression of the disease. Not only must the clinical history of onset be taken into consideration but full appreciation of its very earliest physical signs and the supportive corroboration offered by the leukocyte picture, both quantitative and qualitative, and roentgen ray examination when consid-



ered necessary and available. Immediately upon the completion of such initial positive and differential diagnostic investigation, including examination and typing of sputum when obtainable and blood culture, 2 grams of sulfapyridine should be given. It has been my custom<sup>1</sup> to follow this with an additional 2 grams at the end of four hours and thereafter 1 gram every four hours, to be continued day and night until two days after the temperature drops. After that, 3 grams a day are given for another three days. When there is no striking clinical improvement or drop in temperature after from thirty-six to forty-eight hours of treatment, in spite of a sulfapyridine blood concentration of from 4 to 5 mg. per cent, the drug should be stopped as the patient's immunity mechanism is probably impaired or impotent and specific serum should be given in full dosage without delay, following determination of serum sensitiveness by the conjunctival test. Complete bacteriologic control includes routine blood culture, as well as sputum typing, as a positive blood culture in most instances, justifies the use of combination chemotherapy and specific serum treatment. Combination therapy is also indicated in type III cases or when treatment is begun after the third day of the disease, or in an extremely sick patient past middle life or where pregnancy or significant constitutional disease is present as a complication.

2. Daily leukocyte and Schilling counts, hemoglobin and urine examination during the time of active sulfapyridine therapy and determination of blood sulfapyridine level the second day of treatment represent ideal control, where practically possible. Blood sulfapyridine levels vary considerably with individual absorption rates, but the blood concentration does seem to rise steadily for the first twelve to twenty-four hours and then to assume a moderately constant level. There seems to be no definite correlation between the blood level and the clinical response.

When adequate laboratory control is impossible because of remoteness from hospital and laboratory facilities it is my conviction that the probability of benefit from sulfapyridine therapy far outweighs the chance of potential danger, and I doubt whether any conscientious physician would deny a pneumonia victim the chance of halving the mortality of his disease simply because adequate control was impossible. Under such circumstances I advise such simple precautions as daily urine measurement and examination, daily bedside Talquist hemoglobin estimation and daily simple blood smear, the slides of which can be mailed to the nearest laboratory for a qualitative estimation of the leukocyte picture. Should evidence of leukopenia or agranulocytosis develop the information can be wired or phoned to the physician and prompt cessation of the drug advised.

3. Accessory therapeutic measures indicated in the comprehensive management of any pneumonia patient should be employed carefully such as at-

tention to mental and physical rest, the promotion of general bodily comfort and the provision for oxygen therapy when indicated.

#### INDICATIONS FOR STOPPING SULFAPYRIDINE

1. In order to minimize the frequent nausea and vomiting which accompany the use of this drug, I have been having the tablets enterically coated with salol and now am using an enteric sealed tablet supplied us for investigative use.\* In the event the drug is still not tolerated (nausea and vomiting per se do not contraindicate the continued use of the drug) the sodium salt of sulfapyridine can be given by rectum in a 5 per cent solution with normal saline, or intravenously in 5 per cent solution in a daily total amount of 1 grain (0.06 gm.) per kilo of body weight, divided into two or three doses. Sodium sulfapyridine is supplied in England and France in a 33.3 per cent solution for intramuscular injections. Reports so far have not indicated whether pain or local damage may follow such use but the intramuscular method has been advocated by only one investigator in this country. The hesitancy in using this substance intramuscularly comes from its extremely alkaline nature, it having a pH of 10 to 11, which should render it relatively unsuitable for intramuscular injections.

2. Indications for complete cessation of the drug in any form are leukopenia, evidence of hemolytic anemia and anuria. Hematuria alone does not necessarily indicate stopping the drug in a critical situation where continuation of effective chemotherapy may mean the difference between life and death. It has been determined that hematuria is probably produced from the mechanical irritation of the sharp crystals of acetyl sulfapyridine formed in the tubules, pelves and ureters. I have noted moderate elevation in the blood nonprotein nitrogen along with oliguria in the course of sulfapyridine therapy which subsided promptly upon cessation of the drug and augmented fluid intake with the intravenous injection of glucose and sodium lactate (Hartman's solution).

Cyanosis, other than that produced by the anoxemia of the disease (usually controlled by oxygen therapy, the nasal oxygen method being often sufficient) is combatted effectively in most cases by the use of small doses of methylene blue, 2 grain capsules three times a day. This does not constitute a contraindication for continuation of the drug. Should a serious protracted anuria occur during or following a course of sulfapyridine therapy, it is probable that ureteral catheterization with continued drainage would be indicated by the nature of the pathologic condition associated with hematuria in that it is quite possible that local edema caused by mechanical injury from acetyl sulfapyridine crystals might produce ureteral obstruction at the pelvic orifice.

\*Supplied by Eli Lilly & Company for investigative use.



Other toxic manifestations of sulfapyridine include such phenomena as rash, fever, lassitude, headache and dizziness, none of which constitute a contraindication of the full expression of the drug.

The febrile reactions to sulfapyridine are sometimes considerably delayed and often are difficult of interpretation as Seibert<sup>5</sup> observed five cases showing leukocytosis and a shift to the left from the sulfapyridine effect alone, any evidence of infection having been ruled out. The differential blood picture was characterized by an increase in the immature forms and a decrease of lymphocytes and monocytes, thus presenting an infectious blood picture.

In concluding, I feel that meticulous care and continued careful observation are imperative in order that well ordered progress may continue to mark the advance of chemotherapy in the control of pneumonia.

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#### BIBLIOGRAPHY

1. Rosenthal, Bauer and Braham: Studies in Chemotherapy, Public Health Report 52:662-671 (May) 1937.
2. Special Report of the Council on Pharmacy and Chemistry, Sulfapyridine, J. A. M. A. 112:1830 (May 6) 1939.
3. Plummer, N., and Ensworth, H. K.: Sulfapyridine in the Treatment of Pneumonia, J. A. M. A. 113 (Nov. 8) 1939.
4. Falk, O. P. J.: Current Trends in the Treatment of the Acute Respiratory Infections, Bull. St. Louis Med. Soc. 33:426 (April 21) 1939.
5. Seibert, Walter: Pathologist to DePaul Hospital, St. Louis. Personal communication.

## SYMPOSIUM ON CRIPPLING DISEASES OF CHILDHOOD

### THE CRIPPLED CHILD IN MISSOURI

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Numerous censuses taken throughout the country have shown a uniform average of about three crippled children under 21 years of age to one thousand of population. On this basis there are about ten thousand crippled children in Missouri. (See table 1.) A survey of rural Missouri made in 1934 by the Women's Work Project of the Missouri Relief and Reconstruction Commission, under the direction of the Missouri Society for Crippled Children, showed a rate of between 2.5 per cent and 5 per cent per one thousand of children up to 17 years of age. Dr. William J. Stewart, Columbia, Director of the Crippled Children's Service, in a recent statement says there are 10,080 crippled children under 15 years of age.

These estimates are not entirely accurate but they are close enough to give us some idea of the number of crippled persons in the state.

The survey mentioned gives some interesting information. Approximately 70 per cent of cripples were in rural areas and 30 per cent were in urban communities. This does not include St. Louis, Kansas City, St. Louis or Buchanan counties. Ninety-seven per cent of the children reported were white and 3 per cent were Negroes. It is believed that the number of Negro children reported is too low. There were slightly more boys than girls.

The age at onset for white children offers more material for careful consideration. During the first year of their lives 42 per cent of the boys and 46 per cent of the girls were found to be crippled; of course, the congenital deformities are included in these, and up to the sixth year or the preschool

Table 1. Crippled Children Census Cards Received and Classified

Total cards received		4204
Total cards classified		
White,	2806	
Negro,	83	2889
Not a cripple		134
Over age		296
No information		134
Duplicate cards		182
Moved out of state		57
Deceased		38
		841
St. Louis County		250
Buchanan County		204
Other counties too late to classify		20
		474
	Total	4204

period for these white children, 66 per cent of the boys and 70 per cent of the girls are crippled. This would indicate that a large percentage of the crippled children are not discovered until they have reached school age and that much valuable time is lost.

Clubfoot was twice as common as any other congenital deformity. Poliomyelitis represented 27 per cent of the crippling diseases, followed by tuberculosis of the joints, osteomyelitis and rickets with each about 6 per cent. Burns were more common in the accidental class. Thirteen per cent of all the cases reported were spastics. (See table 2.)

Only 939 records of crippled children out of the 2806 showed a diagnosis by an orthopedic surgeon. An analysis of the 939 records showed 28 per cent congenital deformities, 3 per cent accidental, 53 per cent caused by disease and 16 per cent by other causes, including spastic paralysis.

Out of the 2806 white children referred to, 51 per cent had had the advantage of a diagnostic

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clinic, or possibly other types of clinical service, and 40 per cent had never gone to a clinic. Twenty-eight per cent had never had treatment, 35 per cent had had treatment formerly, and 19 per cent were receiving treatment. Of those not having had treatment 18 per cent were not receiving it because of the financial status of the family. According to the report 12 per cent did not need treatment. (See table 3.)

Table 2. Cause of Crippling

Cause	Number	Per Cent of 2806 Cases
Congenital	580	20.21
Hip dislocation	85	3.02
Clubfeet	216	7.69
Harelip	99	3.17
Cleft palate	120	4.20
Deformity	60	2.13
Acquired (disease)	1012	34.57
Poliomyelitis	473	15.43
Tuberculosis	121	4.31
Osteomyelitis	78	2.77
Rickets	101	3.59
Arthritis	28	.99
Rheumatism	10	.35
Muscle dystrophy	18	.64
Muscle atrophy	13	.46
Pathological paralysis	26	.92
Spina bifida	16	.57
Perthes' disease	2	.07
Little's disease	2	.07
Structural scoliosis	2	.07
Meningitis	4	.14
Torticollis	2	.07
Pott's disease	1	.03
Necrosis of bone	1	.03
Erb's paralysis	2	.07
Curvature of spine	25	.89
Other diseases	87	3.10
Accident	61	2.16
Burn	50	1.78
Fracture	8	.28
Amputation	3	.10
Congenital or Acquired	274	9.75
Spastic	254	9.05
Posture	7	.24
Flat feet	13	.46

Table 3. Treatment

	Number	Per Cent		Number	Per Cent
CLINIC			TREATMENT		
Attended	1456	51.88	Never	791	28.19
Never attended	1124	40.05	Before 1927	215	7.66
			Between 1927-33	808	28.79
			Now	537	19.10
Not stated	226	8.05	Not stated	455	16.28
Total	2806	99.98	Total	2806	100.0
REASONS FOR NO TREATMENT NOW					
Financial	520	18.53			
Not needed	339	12.08			
No progress	245	8.73			
Opposition or indifference	184	6.55			
Not stated	1518	54.09			
Total	2806	99.98			

Table 4. Attitude of Parents

Attitude	Number	Per Cent
Anxious for treatment	1743	62.11
Indifferent or opposed	177	6.30
Not stated	886	31.57
Total	2806	99.98

If one compares table 4 with table 3 relating to treatment received, it will be noted that 28 per cent of these children had never had treatment, 18 per cent of them because of the financial status of the family. However there is still a large discrepancy as yet unaccounted for between the 28 per cent and

the 61 per cent of the parents who wanted treatment for their children and, apparently because of some unexplained combination of circumstances, were unable to obtain it.

Sixty-two per cent of the parents were anxious that their children should have treatment. Only 6 per cent were reported as being indifferent or opposed to treatment, and 31 per cent were not stated. (See table 4.)

Table 5. Needs

Needs	Number	Per Cent
Diagnosis	766	27.29
Treatment	2000	71.27
Schooling	167	5.95
Other	54	1.92
Total	2987	

Total number greater than 2806 because of some reexamination and treatment.

The 2806 white children studied also offered a challenging array of needs, when viewed in the light of other findings together with the resources of the state. Treatment was required in 71 per cent of the cases according to these reports, diagnosis in 27 per cent and schooling in nearly 6 per cent. (See table 5.)

What is being done in the state to provide treatment for these children? There are two types of agencies working for the crippled child, one state and the other private.

The State Crippled Children's Service was created by law twelve years ago. Its administration was placed in the hands of the University of Missouri and is supported by state appropriation. Treatment is given to any indigent crippled child under 15 years of age. Transportation and braces may be supplied by the service. Children must be committed through a county court. At first, all children had to be treated at Columbia. When the Social Security Act became effective the federal government matched the state funds and at the same time suggested that a decentralized service was more desirable. As a result children, whose treatment was paid for by Social Security money, were sent to St. Louis and Kansas City in addition to Columbia. In 1937 the state legislature amended the law to decentralize the service. Now medical care may be given in any part of the state where there is a recognized grade A hospital with an accredited orthopedic surgeon on the staff, who must be a member of the American Academy of Orthopaedic Surgeons or have been certified by the American Board of Orthopaedic Examiners.

The Crippled Children's Service is under the Board of Curators of the State University and an Advisory Committee. It is administered by a director. The Curators, with the advice of the Advisory Committee, pass on all hospitals and orthopedic surgeons. The Crippled Children's law provides purely medical service.

There are educational laws which can, under certain circumstances, provide educational facilities for the crippled child. These are as follow:

"Section 11,147. PROVIDING FOR INSTRUCTION OF DEFECTIVES.—Whenever in any school district there shall be found ten or more children who are blind, or deaf, or who are crippled but yet able to be moved about, or who are feeble-minded and yet capable of instruction, the board of education or the board of directors of the district shall provide appropriate instruction in a special class for such groups of ten or more for each class of defectives, and shall provide transportation to and from school for such children as could not otherwise attend. . . . The instruction given in all such classes shall be limited to the elementary school grades. It shall be the duty of the board of education, or the board of directors in each school district, to ascertain annually the number of children in a district who belong to any of the above types."

"Section 11,148. DISTRICTS MAY JOIN IN FORMING SPECIAL CLASSES.—Where two or more school districts each have less than ten children in any of the classes of defectives provided for in Section 11,147, the boards of education or directors of such school districts may contract with each other for the establishment of special classes for the education of such children in one or the other of said districts, provided the pupils cannot be accommodated in the appropriate state institution established for their training."

Classes shall be approved by the State Superintendent of Public Schools. Districts having special classes may receive state aid up to \$750 provided specially trained teachers are employed.

In Section 11,147 there is a definite mandate to make an annual census of crippled children. As a matter of fact these provisions have not been followed in most districts. In none has there been a school census of crippled children. Lack of funds and lack of interest have probably been the reasons.

Vocational training is available to crippled children over 16 years of age, through the State Rehabilitation Service and is being supplied in many cases.

Private agencies are cooperating with and supplementing the work of the Crippled Children's Service. The private agency, because it is not limited by law, can do many things that the state agency cannot do.

The Missouri Society for Crippled Children devotes itself entirely to the welfare of the crippled child. Its scope is broad and deals with all of the problems of the crippled child. The public and parents are instructed about the importance of early treatment and the prevention of deformity and are told where treatment may be secured. It is a clearing house for information about crippled children and helps other agencies in their problems connected with the crippled child.

As there is no state agency to care for the crippled child over 15, the Missouri Society for Crippled Children has assumed this responsibility. Hospitalization is provided for these older children and

braces and other apparatus secured for them. The society cannot afford to pay for hospitalization but it has had the cooperation of a number of hospitals. As a result few overage children have been refused treatment. The society helps and advises in securing education for the crippled child. This frequently means an outlay of money because the child must, at times, be put in a boarding home to be near the school. The society has also paid the living expenses of some of the older children who are receiving vocational training. Diagnostic clinics have been abandoned to a great extent because they duplicate the work of the Crippled Children's Service.

The Missouri Federation of Women's Clubs was active in crippled children's work long before there was a state service. The federation through its welfare chairman was responsible for the crippled children's law. Diagnostic clinics were held and children were sent to St. Louis and Kansas City hospitals. These have also been given up because of duplication. The federation has been cooperating with the Missouri Society for Crippled Children and helps at diagnostic clinics and in many other ways; the federation gives invaluable aid in securing transportation for crippled children.

Many of the service clubs have been active in working for crippled children, especially as members of local committees.

Local committees organized by the Missouri Society for Crippled Children are valuable in crippled children's work. Some of their functions are to arouse interest for crippled children locally; to help at diagnostic clinics by providing transportation to and from hospital and clinics, and aiding in other ways. They look after children who have returned from the hospital by caring for their needs and seeing that they return to the hospital on schedule for further treatment and observation. Local committees are especially useful in caring for overage children. All the agencies cooperate and supplement each other's work.

To many of us care for the crippled child means only a hospital and surgery and we overlook one of the most important factors in the care of the crippled child, his education.

The best medical care is essential. The body must be made as nearly normal as possible. In many cases this may be 100 per cent but in many more the child will still be seriously crippled. These children can never do hard work. Most of them are normal mentally. Their only hope, then, for economic independence is an education that will enable them to carry on in spite of their handicaps. Crippled children must be given the best education possible, including high school, and this should be followed by vocational training. Finally there should be some provision for placement.

Is Missouri doing all that it can for the crippled child?

The State Crippled Children's Service is seriously handicapped by lack of money. During the



last biennium the total amount received was \$231,820 including federal grants. The state appropriated \$100,000 or \$50,000 a year. The service in addition to the hospital at Columbia controls the Blosser Home for Convalescent Children at Marshall. It has five nurses in the field. The service also holds diagnostic clinics in various counties. It is through these that most of the children are found. Children from the eastern and the western parts of the state are sent to hospitals in St. Louis, Kansas City, and St. Joseph. The Crippled Children's Service pays for these cases.

That the appropriation is insufficient is shown by figures cited by Dr. Stewart. In 1937, 569 children were cared for at all hospitals and 617 in 1938. This represents respectively 5.7 per cent and 6.1 per cent of the estimated 10,080 crippled children under 15 years of age.

It will be seen that through lack of funds the Crippled Children's Service is unable to care adequately for the crippled children.

The Missouri Society for Crippled Children is also financially handicapped. It, however, has been able to secure the help and cooperation of other agencies.

There are practically no custodial institutions in Missouri where hopelessly crippled children, and especially the spastic, can secure care. Neither are there any provisions for placing children in foster homes.

St. Louis, Kansas City, St. Joseph and Springfield alone have special schools for crippled children. There are no provisions in the rest of the state for special education. Vocational training is available to all children who are trainable. This is done through the State Rehabilitation Service.

Placement of the handicapped is difficult in Missouri because of insurance laws that penalize an employer. If an employee with one leg, as an example, were to lose the other through an industrial accident, the employer would have to pay for total disability. In a number of states the employer would have to pay only for the leg lost in his employ. This makes placement of the handicapped easier.

What are the needs of the crippled child?

We need a much larger appropriation for the State Crippled Children's Service. Money spent on the crippled child is an asset because so many of them can be rehabilitated. Missouri spends much less than many neighboring states. Kansas, with a population one half that of Missouri, appropriates \$174,817 yearly; Kentucky with two thirds the population \$110,000; Oklahoma with two thirds the population \$168,000, and Michigan with one and one third the population \$678,000. Missouri gives \$50,000 a year.

The Crippled Children's Service should be expanded. More field nurses should be employed. At present, each nurse has about twenty-four counties to cover. With such a large territory they cannot



Fig. 1. Missouri Society for Crippled Children.

1. County work started or cooperation established with Missouri Society for Crippled Children.
  2. County or local committees affiliated with Missouri Society for Crippled Children.
  3. Clinics held by State Crippled Children's Service, Missouri Society for Crippled Children, various clubs or others.
  4. Public schools or public school classes for crippled children established.
  5. Convalescent homes.
  6. Hospital service at state and social security expense.
  7. Special studies by Missouri Society for Crippled Children.
- Heavy lines show districts in which there are field nurses from the State Crippled Children's Service. There are no nurses assigned to the metropolitan areas. No nurse for district in South Central Missouri; this area is covered by one of the other nurses when necessary.

do adequate follow-up work. With more nurses more clinics could be held and more children of pre-school age would be found and treatment instituted earlier. More adequate after-care would be available. There should be more beds for convalescent treatment. The Blosser Home is now running at about one half to two thirds capacity. There is a possibility that this may be remedied by the present legislature. The age limit should be raised to about 18 years, but with a higher age limit and a small appropriation no more children could be treated.

The state should provide for the custodial care of hopelessly crippled children and there should be a state school where spastic children hopeful of recovery could receive modern training. There should also be some provision for placing a crippled child in a foster home, near hospital or educational facilities. At present there is none.

More special schools and classes should be established. The requirements for an annual census should be enforced. Finally we should change our insurance laws so that the employment of the handicapped will be made easier.

Missouri has a good crippled children's law and the Crippled Children's Service is doing good work under a serious financial handicap. There are adequate provisions for special teaching but they are not used. It is up to us to see that the educational facilities are used and that homes are provided for the hopeless cripple and the spastic child.

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## THE PREVENTION OF DEFORMITY IN CHILDHOOD

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The old adage "An ounce of prevention is worth a pound of cure" may be time worn and trite but it still can be most aptly quoted in any discussion of the problems incident to the physical rehabilitation of the crippled child. To be sure, prevention of deformity is only one of the many and varied problems that confront the orthopedic surgeon in the treatment of the physically handicapped but if the problem of deformity prevention could be adequately solved the battle would be half won before it started. To prove the point, consider these most interesting figures compiled from statistics of a large number of orthopedic clinics.

Of the total number of surgical procedures done, from 25 to 30 per cent have been to correct preventable deformities resulting from anterior poliomyelitis; from 10 to 15 per cent to prevent deformities as of hips, knees or ankles which remained as aftermaths of pyogenic or nonpyogenic joint infections, and 10 per cent to correct rachitic, traumatic and old neglected congenital deformities. In other words, from 45 to 55 per cent of the surgery performed in the average crippled children's hospital conceivably could be eliminated if the problem of prevention of deformity could be solved completely.

It is granted that in rare instances deformities will occur in spite of the best of treatment but in the vast majority of instances it is possible to prevent the development of acquired deformities and to eliminate the secondary deformities which occur as a result of neglect or improper correction of congenital malformations.

No one as yet has succeeded in preventing congenital deformities but in this day and age there should be few valid reasons for delaying the treatment of such deformities any later than the first or second year of life. If treated early, these congenital deformities can be corrected conservatively with only an occasional minor surgical procedure and with reasonable hope of practically normal function of the part involved. All too frequently, however, especially in congenital clubfoot and congenital dislocation of the hip, treatment is neglected until it is too late to effect correction without radical surgical procedures aimed not only at the original deformity but also at the secondary deformities as well. In such cases, although the deformities are amenable to correction, there is always a varying degree of loss of function directly proportional to the amount of surgery necessary to effect the correction. Prevention then, when applied to congenital malformations, implies the early correction of

the existing deformity in order to eliminate the development of secondary bone changes and to preserve as near as possible the normal function of the deformed part.

Rickets still exists as an orthopedic problem. Although this condition is far less frequent than it was fifteen to twenty years ago, one sees a goodly number of severe bowlegs and knock knees in spite of all that is known in regard to prevention. The extreme cases, of course, are encountered in individuals who have had little or no preventive dietary therapeutics and by the time they are seen it is too late to do anything about the rickets. The disease itself has become inactive and the deformities can be corrected only by properly conceived surgical realignment of the crooked bones. There are, however, a considerable number of infants who, during the first few months after learning to walk, develop gradually increasing bowlegs or knock knees in spite of what the family and the doctor regard as adequate antirachitic dietary provisions. These cases are usually sent to the orthopedist for the application of braces on the false premise that the baby is too heavy or that its joints are abnormally relaxed. Almost invariably in such instances, roentgenograms will show active rickets. If the deformities are not too severe and the patient is under 18 or 20 months of age, a cure can be effected without surgery or braces if the antirachitic element of the diet is doubled or trebled. It must be remembered always that the amount of antirachitic intake necessary to prevent rickets in one individual may be totally inadequate in another individual. It is entirely possible therefore for some babies to develop true rachitic deformities in spite of what is ordinarily considered an adequate antirachitic diet. Prevention of deformities of rachitic origin therefore depends entirely on prevention of the disease itself through adequate antirachitic intake even though the dose required may be two or three times the accepted average.

We have no control over the incidence of septic joints, arthritic joints, fractures and other injuries that lead to disability but all of these conditions, if diagnosed and treated early and adequately, should reach their respective end stages with a minimum amount of loss of function and little or no deformity.

It is impossible at times, even with early drainage, to prevent partial or complete ankylosis of septic joints, but it is possible to prevent them from getting stiff in a deformed and useless position. In the zeal to save the life of an acutely ill patient with joint infection, one should never lose sight of the fact that if the patient does survive he should recover with the involved joint in the best func-

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tional position for future use. Shoulders should not be allowed to become ankylosed in an adducted position. Elbows should not be allowed to become fused in complete extension or in acute flexion, nor should wrists be allowed to fuse in palmar flexion. If there is no way to prevent fixation of the forearm, it should be held midway between supination and pronation. In the lower extremity, the foot and ankle should be held in slight equinus, the knee in 10 to 15 degree flexion and the hip in 20 degree flexion, slight external rotation and in the neutral position in regard to abduction and adduction. Any or all of these positions can be maintained without difficulty even in acutely ill patients. Padded wire metal splints, plaster molds, adhesive traction, pillow splints and sand bags all can be utilized to immobilize joints in good functional position both during the acute illness and throughout convalescence.

With the subsidence of the infection, measures directed toward restoration of motion can be instituted in those joints not permanently destroyed or fixed. In all partially ankylosed joints, the best possible method to increase motion is active use of the joint by the patient with his own muscles. Heat, massage and passive movement without force are helpful adjuncts to active motion but forced manipulation and passive stretching to the point of pain is the surest way of delaying the progress of the patient. Such manhandling only serves to make a bad situation worse.

What has been said of septic joints also holds true in nonsuppurative arthritis, notably in Still's disease and other allied conditions. It may not be possible to preserve joint motion in these cases even with the best of therapeutic measures but, if ankylosis does occur, the involved joint should be in good functional position for future use.

In fractures and other traumatic injuries, the prevention of future deformities depends in a large measure on early adequate treatment. Space does not permit any detailed elucidation of the many and varied individual situations that arise, but suffice it to say that adequate treatment of traumatic injuries implies the accurate anatomical restoration of the injured part, be it a broken bone or a cut tendon. After such anatomical restoration the part should be thoroughly immobilized until healing is complete.

We do not know how to prevent anterior poliomyelitis or how to control the amount of paralysis in any given case but we do know that careful splinting during the acute and convalescent phases of the disease will prevent the development of soft part contractures and bone deformities which, as has already been mentioned, make up from 25 to 30 per cent of the corrective surgical work in any orthopedic hospital. To prevent these deformities, it is essential that a patient afflicted with anterior poliomyelitis be placed in the neutral rest position as soon as possible after the diagnosis is established. During the stage of acute illness, this can be done

with pillows, folded blankets or sand bags. Later, after the fever subsides, wire splints or plaster casts and molds should be used in place of the more or less improvised supports used in the acute stage. A Bradford frame is a distinct aid in handling a paralyzed patient but is not absolutely essential. Immobilization in the neutral positions will prevent deformities and at the same time will prevent muscle fatigue and muscle stretch, both of which are most detrimental to muscle recovery.

Briefly the ideal or neutral positions for complete protection are as follows:

1. Entire body supine with very slight elevation of the head and shoulders.
2. From 75 to 80 per cent abduction of the shoulders.
3. Right angle flexion of the elbows with the forearms in the midposition.
4. Wrist in dorsiflexion with the fingers relaxed in slight flexion and the thumb pointed toward the middle finger.
5. Hips in complete extension and abducted from 15 to 20 degrees and in the neutral position of rotation.
6. Knees flexed from 10 to 15 degrees.
7. Feet in very slight equinus and in slight inversion.

With the patient maintained in these positions, deformities cannot occur. The length of time this immobilization should be maintained varies with the individual but in every instance should be maintained until all hope of future muscle recovery is over.

When the patient is finally ambulatory all necessary supportive apparatus in the way of braces should be made as light as possible and should be constructed with the idea of protecting the weak muscles and preventing deformities.

In conclusion let me again urge the correction of congenital and birth accident deformities early in life before secondary changes occur. Let me remind you that rickets and its bone sequelae can be prevented but it occasionally requires double and treble doses of antirachitic measures to protect some individuals. Remember also that even though we cannot control the incidence of infections or traumatic injuries, we can treat them with the aim of preserving maximum function and the minimum of deformity. Finally, let me plead for the adequate immobilization of patients with anterior poliomyelitis so that they can reach the end stage without deformities.

Shriners' Hospital.

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#### AMOUNT OF WORK DONE BY HUMAN HEART

The human heart does less work when the individual is standing for a considerable length of time than when he is at rest, *The Journal of the American Medical Association* for Nov. 25 states.

This is due to the effect of gravity in depleting the amount of blood coming back to the heart and therefore the amount of work accomplished by the heart.



## INFANTILE PARALYSIS

WILLIAM J. STEWART, M.D.

COLUMBIA, MO.

Infantile paralysis in its acute stage may occur at any time of the year but is most prevalent in the summer and early fall months. A typical case usually starts with four or five days of general malaise and a febrile period followed by pain in the involved extremities, muscle weakness and complete paralysis. Less typical cases may have no prodromal symptoms and the paralysis may be the only abnormal finding. Acute cases should be isolated and splints applied to the involved extremities immediately. The feet should be supported at right angles to the leg, knees and hips should be straight and the patient put flat in bed so as to secure immobilization of the trunk muscles. The upper extremity is usually abducted 90 degrees at the shoulder and externally rotated with the elbow flexed 90 degrees and the wrist and fingers in complete extension. These positions for upper and lower extremities, in general, are considered neutral positions and will prevent marked flexion and extension deformities of the involved joints. Lumbar puncture at this stage may be helpful but in many cases may not yield any particularly characteristic information.

Orthopedic consultation is desirable early in the disease in order to plan a course of treatment for the particular case, much of which can be carried out at home.

The treatment of infantile paralysis is essentially mechanical. Convalescent serum and special drugs are controversial points in the light of the present lack of knowledge of the etiology of the disease. After an initial period of rest and immobilization in splints, massage of the affected extremities and motion of the joints of the affected extremities may be started but the time of starting such massage and motion will depend upon the condition of the individual case. No procedures should be instituted as long as pain and tenderness of the affected extremities persist. One cannot err by delaying the application of these measures. As a matter of fact, much harm can be done by the too early ambitious institution of massage and physical therapy procedures.

After massage and motion are started detailed muscle examinations should be made at regular intervals such as once a month. The improvement in any patient will manifest itself by increased

function of individual muscles or groups of muscles and can be detected by the periodic muscle examinations. Weight bearing and full functioning of the patient may be permitted with the aid of properly designed and fitted braces several months after the onset of the illness, but this also will vary in individual cases and should be undertaken only after adequate and qualified consultation.

The operative treatment of deformities occurring in infantile paralysis should be considered only after the patient has had a thorough and adequate course of massage and muscle reeducation so as to permit proper evaluation of the maximum amount of muscle function that he may have regained. In general, surgical procedures probably will not be advisable in less than two to four years following the onset of the disease. The operations that may be indicated will depend upon the age of the patient and the types of deformities that are present. All surgical procedures should aim toward eventually restoring as much normal function to the patient as possible with the minimal amount of apparatus.

It is difficult to make any accurate statement about the length of time that this whole course of observation and treatment will consume but in most cases, where the paralysis is of any consequence at all, it is fair to assume that regular re-checking examinations should be continued through the entire growth period of the patient and even extend well into his adult years. Necessarily, some individuals who suffer a maximal amount of paralysis will require observation, brace adjustments and other forms of treatment throughout their entire lives, while a large number who have minimal paralysis may recover excellent function in a few months.

From the standpoint of an orthopedist, I should like to emphasize the immediate splinting of extremities of any child who is even suspected of having an acute attack of infantile paralysis and adequate prolonged splinting. It is difficult to prove, but it is my impression, that a high percentage of orthopedic deformities could be prevented by this simple procedure. Thus, a great many crippling deformities would not occur and a major part of the surgery that is necessary in correcting these deformities could be obviated.

University Hospitals.

## CEREBRAL SPASTIC PARALYSIS

FRANK D. DICKSON, M.D.

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Among the many hazards of childbearing is the danger of serious injury to the nervous system of the newborn child. Many infants sustain mild trauma to the central nervous system at birth and

suffer no permanent consequences; many suffer serious damage and die at birth; a considerable number sustain serious damage to the cerebral cortex but survive and go through life with serious

mental and physical handicaps. It is this latter group with which this paper deals.

*Etiology.*—The cause of injury to the central nervous system in the newborn is, in the vast majority of cases, intracranial hemorrhage. Such intracranial hemorrhage is, as a rule, due to excessive stress or pressure on the head during its passage through the birth canal. Among the most common conditions which produce such damaging stress on the fetal head are: contracted or malformed pelves, rigid soft parts, precipitate or prolonged labor, high forceps delivery, breach extraction and enlarged fetal head. Under such circumstances the trauma which the head suffers causes rupture of blood vessels through a shearing action of the overlapping cranial bones or a tear in a dural fold, particularly the tentorium, with hemorrhage into the cerebral cortex or subdural space. Delayed coagulation time, syphilis and other causes may occasionally act as predisposing factors but they are unimportant compared to the mechanical effects of trauma. There are two other factors which apparently must be given consideration: asphyxia and anoxia. Asphyxia is, as a rule, due to wrapping of the cord around the neck or too delayed a passage through the birth canal. Anoxia is a condition in which there is a deficient concentration of oxygen in the fetal blood due to anoxia of the mother's blood from various causes or to some fault in the placental circulation. Asphyxia, by increasing the intracranial blood pressure, may result in intracranial hemorrhage, while in anoxia there occurs localized degenerative changes in the cerebral cortex similar to those found whenever the blood supply to the brain is deprived of its minimal supply of oxygen from any cause such as temporary strangulation.

*Pathology.*—Intracranial injury at birth is, in the main, destruction of cortical areas by hemorrhage, either massive or petechial. Secondary to such destructive hemorrhage, there occurs degeneration of the injured nerve cells in the cortex or basal ganglia and in the corresponding tracts of the spinal cord.

*Symptomatology.*—This may be divided into symptoms found in the newborn and those which characterize the later stages of the disease if the child survives.

The early signs of intracranial hemorrhage are distinct and should be familiar to every practitioner of medicine. The outstanding signs are asphyxia and a child difficult to resuscitate. The child may be what is described as a "blue baby" or may be quite pale, the so-called "pallid asphyxia." The latter is more serious and is in reality a vasomotor collapse due to medullary injury. If respiration is established, the child, as a rule, is sluggish and unresponsive, its cry is feeble and the child does not nurse. Often, however, particularly in the less severely damaged case, the child is restless and cries almost constantly. The pulse is usually slow and weak but may be feeble and rapid. Rigidity of

the leg and arm muscles, contraction of the head and spontaneous twitchings of the extremities may be present. Convulsions, local or general, frequently occur during the first few days and may persist. Lumbar puncture yields a bloody fluid under considerably increased pressure.

Later symptoms, that is those which become evident when the child is from 6 months to 1 year old, are unmistakable. There is spasticity of the muscle groups which prevents normal activity. This spasticity may affect the entire body from the head to feet, it may involve all the four extremities, it may affect only one extremity or only a few muscle groups in one extremity. The child is slow to sit up and cannot maintain a sitting position. There is frequently inability to stand or walk because of spasticity of the leg muscles with typical equinus foot and scissors gait. The inability to stand is often due to some serious interference with the child's balancing sense. Drooling from the mouth is commonly seen and inability to enunciate words is frequently present. Athetoid movements are seen in those patients in whom the basal ganglia are affected.

The mental condition of the child usually excites considerable anxiety on the part of the parents. There is nearly always mental impairment due either to severe injury to the higher centers of the brain or simply to retardation during the developmental period. It should be borne in mind that many spastic persons are normal or even above normal in intelligence but are hampered in their development by the inability to be articulate and express themselves or are held back by motor handicaps. It is never wise to be too hasty in arriving at a decision that a child is mentally deficient for it may be only a question of retardation backwardness.

*Treatment.*—The treatment of the spastic child has been shamefully neglected on the whole, chiefly because of the widespread belief that all spastic persons are subnormal if not actual idiots, and particularly because of the difficulties encountered in carrying out effective treatment. Today, a great deal of earnest thought is being given to improving the treatment of spastic individuals and a rational line of management gradually is being developed. Space will permit only a cursory consideration of the treatment.

The treatment immediately after birth, in my opinion, should consist chiefly of supportive measures and spinal drainage. Spinal drainage should be done daily as long as any blood is found in the drawn-off cerebral spinal fluid. There are many who object to spinal drainage contending that it does no good. The work of Sharp and others, as well as my own experience, leads me to believe, however, that spinal drainage is harmless, rational and the only method which appears to offer at least a hope of minimizing the effects of intracranial hemorrhage.

The later treatment of the spastic infant should



aim at preventing the development of deformity, so far as possible, by the use of pillow splints, changing the child's position frequently and manual stretching of contracted extremities. As the child grows older, every effort should be made to develop what muscle control he may have. This is accomplished by exercises designed to bring about muscle reeducation. Such educational exercises demand patience and must be carried out over a long period of time, but the results attained by persistent and intelligent effort are frequently surprising. One of the most important handicaps to be overcome in a spastic child is the interference with speech, and speech training should be started early and persisted in. Inability to express themselves is one of the great obstacles to progress, both mental and physical, in spastic patients.

Operative measures, in selected cases, are of great help in removing obstacles to satisfactory muscle reeducation but should not be looked upon as curative; they can never be anything but a means of helping the spastic patient to help himself. Operative procedures have two purposes:

(1) overcoming deformity, and (2) attempting to reestablish muscle balance between antagonistic groups of muscles when one group is more active than the other. The operations available for these purposes are: (1) tendon lengthening; (2) tendon transplantation; (3) Stoffel operations for partial resection of motor nerves to spastic muscles, and (4) arthrodesis. All such operative procedures must be followed by careful muscle training or they probably will be productive of no lasting good.

In conclusion, it may be said that the spastic child is with us and always will be with us and is entitled to help and improvement if possible. A considerable proportion of spastic persons are not seriously impaired mentally and, if given some help, may be enabled to lead satisfactory and useful lives. These unfortunate individuals should not be looked upon as being beyond help but, on the contrary, should be offered every opportunity for whatever physical improvement is possible and given a chance for the development of whatever mental capacity they possess.

1400 Professional Building.

## TUBERCULOSIS OF THE BONES AND JOINTS

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Due largely to the campaign for the prevention of tuberculosis, which is directed especially against the pulmonary form of the disease, tuberculosis of the bones and joints is much less frequent today than it was twenty-five years ago. However, it is still the most common chronic disease of the skeletal system in children. Likewise, it is a relatively important cause of crippling, not because the cases are numerous but because practically every joint which is infected with the tubercle bacillus is permanently damaged and most of them are destroyed.

While tuberculosis may attack the bones and joints of adults, it is primarily a disease of childhood as about 90 per cent of the cases occur in children under 14 years of age and almost half of them develop in children between the ages of 3 and 5. The spine is most frequently affected, then the hip and the knee and ankle next. Tuberculosis is relatively rare in the upper extremities.

The disease is due to infection with the tubercle bacillus, either the human or the bovine type. The human type enters through the respiratory system and reaches the peribronchial lymph nodes. The bovine type enters through the gastrointestinal tract and gets to the retroperitoneal lymph nodes. From the lymph nodes either type may reach the blood stream and be carried to the bones and joints.

The disease involves the weight bearing portions of the skeleton (spine and lower extremities) in over 75 per cent of the cases which suggests that trauma may be a factor in the etiology of the disease. It is believed that minor injuries and strains may cause minute hemorrhages in bones, especially near the epiphyseal lines, which result in areas of lowered resistance where organisms in the blood stream may settle and begin to multiply.

As the tubercle bacilli multiply, epithelioid cells accumulate in the area and typical tuberculous granulation tissue develops. This contains tubercles and giant cells and as this tissue increases in amount its central portion dies and becomes caseous. The area of disease increases in size and invades and destroys the surrounding bones. It is characteristic of tuberculosis in bone that the bone usually plays a passive role and when destroyed makes little effort to repair the defect. The disease spreads to the joint and the infection rapidly involves the entire synovial surface which is converted into a tuberculous membrane. This tissue then erodes the margins of the cartilage and gradually the articular surface is destroyed.

The hypertrophied synovial surface layer pours excess fluid into the joint and may degenerate and form abscesses. These abscesses may become large and following lines of least resistance may approach the surface at points removed from their origin. They are called cold abscesses because they are not characterized by the local heat, redness,

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pain and tenderness which are prominent features of acute pyogenic abscesses. The tuberculous abscesses may rupture spontaneously and form chronic sinuses which eventually heal or they may become inspissated and calcified.

Eventually the areas of disease in the bone and joint become walled off by dense fibrous tissue and the disease becomes quiescent. This condition is not reached until a variable amount of destruction has occurred. In the spine this leads to a kyphosis or hunchback deformity and in the joints of the extremities to a fibrous ankylosis with a variable degree of flexion deformity. In addition to the actual destruction of tissues, there is marked atrophy of bone and muscle in the involved extremity and interference with growth. As the disease often begins in early childhood this interference with growth may result in considerable shortening.

The early diagnosis of bone and joint tuberculosis is not easy and usually a definite diagnosis is not made until there has occurred sufficient destruction of bone to be visible in the roentgenogram. However, I do not think that an early diagnosis is extremely important because it has been my experience that once a large joint is attacked by the disease, that joint is doomed; and the same is true of a given area of the spine. I have not seen tuberculosis of a large joint heal resulting in a useful range of movement, nor have I seen tuberculosis of the spine heal without ankylosis of the involved area.

To my mind, therefore, the important thing is the final correct diagnosis and not the early diagnosis. The pathological process continues over a period of years. Since treatment cannot often eradicate the local disease and preserve a movable joint, an early diagnosis is not important; but it is important to make sure whether or not a given joint or spine lesion is tuberculosis before one actually starts to treat the patient for this disease.

A chronic monarticular arthritis in a child should be regarded as tuberculosis until it is proved otherwise, but it should not be treated as such until the diagnosis is fairly certain. The same is true of a chronically stiff and painful back in a child. The symptoms not only vary with the region involved but vary greatly in different patients and in the same patient at different times. Pain and inability to use the affected part normally are the earliest symptoms. There may be general ill health or the child may be robust. As the disease progresses local signs of swelling, deformity and tenderness develop, but there is nothing characteristic about these signs or symptoms.

In the spine and hip the diagnosis, as a rule, is not made until the characteristic bone destruction with little or no attempt at repair enables one to make the diagnosis in the roentgenogram. In the knee and ankle joints fluid can be aspirated and injected into a guinea pig. If the animal develops tuberculosis the diagnosis is made. If it does not, the patient probably does not have tuberculosis. A

negative skin test is strong evidence that the patient does not have tuberculosis, but a positive test is only suggestive in that it shows that the patient has at some time harbored the tubercle bacillus and become sensitive to it. Biopsies for the diagnosis of tuberculosis are discouraged because the operation may spread the disease along the tract of the wound and cause troublesome sinuses.

The patient suspected of having bone or joint tuberculosis should be treated symptomatically until the disease has developed to a point where a fairly positive diagnosis can be made. From this point on every effort should be made to increase the general resistance, better the state of nutrition and induce a state of dormancy in the disease. This means that the patient should have a well balanced diet high in calories and containing ample vitamins and that he should have plenty of fresh air and sunshine. If possible, a heliotherapy regime may be used but this must not be expected to cure the disease.

The diseased part must be put at rest which must be continuous, prolonged and as complete as possible. If the spine or a lower extremity is involved the patient must be recumbent as weight bearing and rest are incompatible. This is true regardless of the type of brace or support used. Consequently, the patient must stay in bed all of the time until the disease becomes quiescent. This may be from six months to two years or more. Flexion deformities of the spine can be corrected by hyperextension frames or plaster of paris shells and those of the extremities by traction or by successive plaster of paris casts.

I believe the course of the disease can be greatly shortened and the end result improved by ankylosing the involved joint or the involved area of the spine by a surgical operation. These arthrodesing operations are usually difficult and rather formidable procedures and should not be undertaken by a surgeon who is not especially qualified to do this type of work. Also, it is important that the disease be relatively quiet when the operation is performed; otherwise, the trauma of the operation may cause the disease to become extremely active and cause not only a failure of the operation but the death of the patient. If the operation is successful, bony ankylosis in good functional position is the result and this nearly always leads to a permanent cure of the localized disease.

Tuberculosis of bones and joints, while not frequent, is a serious disease in those whom it attacks and usually results in marked crippling even when the patient is given the most expert treatment over a prolonged period. Consequently, it should be prevented if possible. In order to decrease the number of cases all children should be well nourished and get plenty of fresh air and sunshine in order that they maintain a high general resistance to infection. It is even more important that they should be protected from infection. This means that milk and butter should be boiled unless it is

known that they come from cattle which do not have tuberculosis. It is even more important to prevent children from contact with persons who have tuberculosis in the infectious stage. This last

measure should be enforced even if it leads to the separation of children from their parents over a considerable period of time.

215 Beaumont Building.

## PYOGENIC OSTEOMYELITIS

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ST. JOSEPH, MO.

The high mortality, morbidity, chronicity and crippling effects of pyogenic osteomyelitis are dreaded alike by laymen and physicians. This has led to an erroneous and hopeless attitude. The onset in the vast majority of cases is in the first or second decade of life.

One per cent of all admissions to the University Hospitals at Iowa City are due to pyogenic osteomyelitis. Eighty per cent of these patients had been affected for from six months to seventy years. This situation does little credit to accepted methods of treatment in the past. It is my purpose to present briefly therapeutic principles which are adaptable to the complex, variable and vexing elements involved.

Pyogenic osteomyelitis is an infection in bone caused by bacterial organisms, the staphylococcus in 90 per cent of cases. The necrotizing action of the staphylococcus exotoxin causes severe local and systemic damage resulting in sequestrum formation in most survivors. In acute fulminating types the mortality may reach 50 per cent. Ninety per cent of all deaths from acute osteomyelitis occur in the first two weeks of the disease. Although the exotoxin has been known for a long time advances have been made only recently in the development of staphylococcus toxoid and antitoxin for therapeutic purposes.

Streptococcal, mixed infections and other more unusual bacterial forms may be encountered. The latter group are characterized by a more benign inflammatory reaction and clinical course. The importance of a careful laboratory investigation is obvious. All osteomyelitis patients should be hospitalized immediately. Only in this way can the entire life history of the disease be truly elucidated.

The mechanism of these bone infections permits their classification as direct (primary) and indirect (hematogenous or blood born) pyogenic osteomyelitis. Direct infections occur from compound or operative wounds or by extension from a neighboring suppurative focus and comprise about 25 per cent of all cases. Seventy-five per cent of osteomyelitic infections occur through the blood stream and are accompanied by a general systemic as well as a local bone reaction. The exact relationship between the general and local infections, although somewhat obscure, is certainly in a state of flux. Their reversibility explains remote flares, recurrences and metastases.

Clinical observation shows that the mortality in the acute stages is due to the systemic or general infection (bacteremia). The mortality from an uncomplicated bone lesion alone is nil. Residual disability in survivors is due entirely to the local infection. Treatment therefore should be directed primarily against the systemic infection and secondarily toward the local lesion.

Hematogenous pyogenic osteomyelitis affects male children about twice as frequently as female. The mortality in females is also considerably lower, a point worthy of further study. Any portion of the bony skeleton may be affected but the lower end of the femur and upper end of the tibia are the most common sites. The bones of the upper extremity may have metastatic localization. Lesions of the spine and pelvis are more common than has previously been suspected. The more unusual localizations may add almost unsurmountable difficulties to diagnosis and treatment.

The many variable and contradictory phenomena attending the pathogenetic development of the disease demand a more harmonious point of view. The clinician may conveniently think of the various stages of hematogenous osteomyelitis as pre-clinical and clinical. The former includes such predisposing and trigger causal factors as port of bacterial entry (boils and other topical or systemic infections), trauma and lowered immunological resistance. The clinical phase is manifested by signs and symptoms of a systemic and local infection. During this phase the bony site of election is being bacterially "seeded." A severe initial systemic reaction however may mask or subordinate the local symptoms for a time. At this stage the patient merely presents symptoms of an acute infection. Such a patient who complains of or exhibits evidence of pain and disability in one extremity always should suggest the possibility of a bone infection. Subsequent objective peripheral signs and symptoms of inflammation will be more readily noted and recognized by the physician who is thus on his guard. Frank suppuration need not be expected in all cases. The local lesion may abort spontaneously or dry sequestration may result. However, in the usual case both suppuration and some degree of bone destruction do occur.

Since the vast majority of local lesions occur in the neighborhood of epiphyseal regions near joints the most troublesome feature of early diagnosis is



differentiation from actual joint involvement. Frequently the aspirating needle must be used. The earliest local signs are a point of maximum tenderness to digital pressure and an associated eccentric muscle spasm of the contiguous joint. In other words, some joint motion always can be elicited by gentle manipulation if the child's attention is distracted. Sedation may be necessary preliminary to examination of an apprehensive child. As the lesion develops, infiltration, superficial venule distention, heat and redness soon appear. Fluctuation finally causes parosseous suppuration. As a general rule frank suppuration ushers in a less trying period for the affected individual.

Roentgenograms seldom show changes before the second week. The earliest sign is an osteoporosis (decalcification) soon followed by periosteal reaction (new bone formation) sequestration, and contiguous reaction at a distant site which is entirely passive in so far as actual infection is concerned. One should remember in evaluating roentgenographic changes that much of what appears to be destructive is merely circumferential reaction of living bone about the infected infarct.

Since hematogenous osteomyelitis begins as a systemic infection the key to treatment resolves itself into its primary and secondary control. Primary control consists essentially of the medical or symptomatic initial treatment. Secondary control is well timed simple drainage of the abscess. The more radical operative procedures are withheld until the residual stages of the disease are established.

Prevention and prophylaxis demand adequate treatment and guarded convalescence in any local and general infections; social hygiene and supervision of activities for those who might be expected to develop the disease. Since it has been found (Robertson) that topical skin infections do not excite an antitoxin increase in the circulating blood, administration of staphylococcus toxoid or antitoxin or both is suggested for preosteomyelitic conditions.

Careful observation of the hospitalized patient and deliberation are the keynotes of therapeutic management of the clinical stage of the disease. The general condition of the patient and the presence or absence of pus must guide the surgeon. Operation is contraindicated until definite suppura-

tion has occurred and evidences of clinical equilibrium are manifest.

The most aggressive measures usually are directed first against the systemic infection by sedation, chemotherapy and immunotherapy (sulfanilamide or its derivatives and staphylococcus antitoxin), oral and parenteral fluids, repeated small transfusions, splints and traction, the latter forming the first line of defense against impending deformity.

Early radical operation does not diminish the period of convalescence. Therefore, secondary control of the disease is inaugurated by a well timed and planned incision and drainage of the parosseous abscess. Recent studies show that the mortality is lowest in those cases which are subjected to operation during the second week of the disease. Simple incision and drainage are usually followed by relief and continued improvement. Interval roentgenographic studies will reveal evidences of bony participation and its demarcation in due time in progressive cases. At this phase radical intervention is urgent.

Since secondary control of the disease is based on anticipation of local complications, Orr's general principles of treatment are instituted and persisted in from the onset of peripheral subjective symptoms. The radical measure so essential in the residual phases of the disease otherwise would not be feasible. Locomotor disturbances of mechanical origin and secondary infection can be controlled most uniformly by adequate rest of the part in a plaster cast and minimal interference with the postoperative sinus by infrequent dressings under aseptic precautions. The use of gauze impregnated with cod liver oil or ointment (White) is suggested as an adjunct to the ordinary vaseline pack. Operative wounds must be left wide open until the infection has subsided.

A flare-up demands the same serious consideration as the initial evolutionary phases of the disease. Its evaluation and management often will tax the patience, judgment and ingenuity of the surgeon to the utmost. When the flare-up is associated with a marked systemic reaction the primary threat to the patient's life is reduplicated. The patient's volunteered subjective sensations should be carefully noted as an aid to diagnostic and therapeutic interpretation.

321 Kirkpatrick Building.

## DEFORMITY FOLLOWING ACCIDENTAL INJURIES

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Deformity may be expected after extensive burns or when large areas of skin are avulsed or destroyed by ulceration. The attending physician may do much to lessen the deformity by keeping the parts immobilized in the anatomical position or a little beyond it in the direction opposite to the

expected contracture. Every effort should be made to secure healing as soon as possible, using skin grafts when they are indicated. Any severe residual deformity is usually a problem for the plastic surgeon.

When tendons have been cut and left unsutured

or the sutures have sloughed out, deformity may be expected from the unopposed action of the opposite muscles. Tendon grafting is usually required at a later date.

The condition which often causes unexpected deformity is ischemia. This means that the venous circulation is retarded and there is an exudate of leukocytes and a multiplication of connective tissue cells which result in scar tissue everywhere through the soft parts with contractures and serious disability. The extreme form of this trouble is called Volkmann's ischemic paralysis but there are many cases in which the same condition prevails to a lesser degree. It is often caused by splints or casts which were put on too tight or which became tight by subsequent swelling beneath them. Encircling bands of adhesive plaster may have the same effect. The acutely flexed position, often used in treating fractures near the elbow, may cause ischemia. Sometimes the pressure of a hematoma under the deep fascia produces this condition when no snug dressings have been used. The tension from such a hematoma should be relieved by surgical incision under strict antiseptic precautions and without drainage.

Limbs which are the site of severe contusions and of inflammatory processes should be splinted. The patient has less pain and inflammation is more easily controlled when the soft parts are at rest. Deformity is less likely to follow.

One of the common causes of deformity is the position of the limbs during a long confinement in bed. This is especially true in cases of arthritis. The patient is more comfortable with a large pillow under the knees. In a few months, or even weeks, there are severe contractures of the hamstring muscles, fascia and posterior ligament of the knee. There is also contraction of the fascia lata which holds the hip partly flexed and of the tendo achillis drawing the heel high up. Similar contractures may follow in cases of traumatic arthritis or after confinement in fracture dressings with these joints in unfavorable positions.

Deformity often results from malunion of fractures and occasionally from nonunion. Most cases of nonunion are due to interposition of soft parts or to inadequate immobilization. The bones are not kept at rest long enough. There are a few patients who simply do not produce and harden callus. This is similar to cases of hemophilia in which the blood does not clot firmly; but in the case of fracture callus we do not know the biochemical reason.

In the malunions, some of the fractures were never properly reduced and others were not splinted properly or for a long enough time.

The cases that surprise one are those which appear to have a firm union and angulation begins a few weeks after the splints are removed and increases to a severe deformity. Apparently there was a lot of callus but it was of poor quality, and, when it was used, bending occurred as in a bad case of

rickets. Many malpractice suits arise from this late angulation. No physician should dismiss a patient who has had a fracture without having a roentgenogram showing the condition at discharge. If he is experienced, he may recognize the fact that the callus is too light and spongy. In any case, the roentgenogram will show that the bones were in good position and the limb straight when he dismissed the patient. With such a roentgenogram as a record, it is almost impossible to make a case against the doctor. The habit of merely looking with the fluoroscope is a bad one. This has its proper place during treatment but the last observation must be a film which is a permanent record.

300 Argyle Building.

## SPECIAL ARTICLES

### IMPROVED METHOD OF REPORTING THE STANDARD KAHN AND QUANTI- TATIVE TESTS

JOSEPH C. WILLETT, D.V.M.

ST. LOUIS

The St. Louis Health Division Laboratories used the original one tube Kahn test in conjunction with a complement fixation test from 1923 to 1927. From 1927 to the present time the standard Kahn test has been used exclusively.

Serologic results in the diagnosis of syphilis were reported to the physician by the use of the customary symbols until April 1937 when the method of reporting was changed to positive, negative and doubtful in conformity with the recommendations of the U. S. Public Health Service.<sup>1</sup>

The Kahn quantitative procedure has been available to physicians upon request since 1927<sup>2</sup> and in 1938 the offer was repeated in a special explanatory letter. Physicians however still did not fully understand the practical utilization of this procedure and to most of them it proved quite confusing.

The personnel of the Laboratory was convinced of the merits of the Kahn quantitative procedure through its extensive application on specimens from the various Health Division Clinics. Notwithstanding this favorable experience, it was obvious that if it was to be of practical value to the general practitioner it must be done routinely and reported in a self-explanatory way.

Since October 2, 1939, the Kahn quantitative results have been reported routinely using the graphic report form illustrated in figure 1 accompanied by explanatory notes on the reverse side.

This method of reporting is of distinct value since it helps the physician in following the progress of treatment, it can be easily understood by the patient and encourages him to continue neces-

<sup>1</sup>From the Laboratory Section of the St. Louis Health Division.



## CITY OF ST. LOUIS

Health Division—Laboratory Section

Laboratory Number ..... 19 .....

Name ..... Address .....

Specimen ..... Taken on .....

Dr. ....

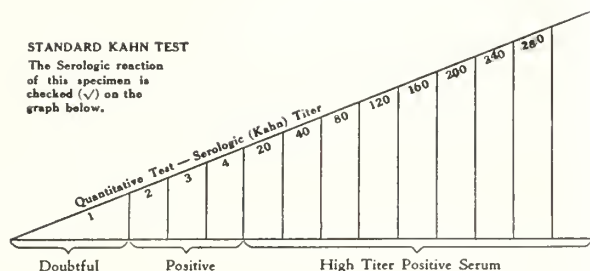


Fig. 1. Face of the Report.

Below: Reverse Side of Report Form.

## INTERPRETATIONS OF SEROLOGIC REACTIONS

1. The numbers on the graph refer to the Kahn titer which is determined by serum dilution methods similar to those used in agglutination tests. The Kahn titer number is obtained by multiplying the arbitrary figure 4 by the last positive serum dilution. For example, when a 4 plus serum gives a reaction in a final serum saline dilution of 1:5 the Kahn titer is 5 times 4 or 20, or if the final reaction occurs in a final dilution of 1:10 the Kahn titer is 10 times 4 or 40, etc.

2. Reactions of 2 plus, 3 plus or 4 plus with the Kahn standard tests are reported "positive."

3. Reactions of one plus or doubtful in the standard test are reported "doubtful."

4. A negative reaction is reported "negative."

5. If laboratory findings do not agree with clinical findings, it is suggested that additional specimens be submitted.

## Other Tests for Syphilis

1. Darkfield for *T. pallidum*.—Send patient to laboratory.

2. Kahn and colloidal gold tests on spinal fluid.

sary treatment. Statistically it shows the effect of treatment of syphilis in the community and is, therefore, of distinct public health value.

The technic of the quantitative test<sup>3</sup> requires eight serum dilutions. We have reduced this number to five, from 1 to 5 to 1 to 40 inclusive. We have found that 90 per cent of all syphilitic sera have end point reactions within this range. Those hav-

ing higher titers are titrated to the end point. These laboratories have on an average 180 Kahn tests a day and from 10 to 15 per cent of these are titrated by the quantitative procedure. Two persons devote all of their time to this work.

The use of the combined standard and quantitative Kahn tests is practical as a routine procedure and can be applied readily and economically in any well equipped diagnostic laboratory. This procedure of reporting the standard Kahn and quantitative tests has the advantage of giving more complete information than any qualitative, precipitation or complement fixation test.

In developing this procedure I had the advantage of consulting with Dr. R. L. Kahn, Dr. F. G. Gillick, Supervisor of Venereal Disease Control, and Mr. N. Nagle, Supervisor of Bacteriology and Serology.

St. Louis City Health Division.

## BIBLIOGRAPHY

1. Ven. Dis. Inform. 6:13 (June) 1935.
2. Editorial: The Kahn Test Adopted as Standard by the St. Louis Health Department, J. Missouri M. A. 24:425 (September) 1927.
3. The Kahn Test, A Practical Guide, Baltimore, Williams & Wilkins Co. 1928.

THE ROAD BACK: THE MISSOURI  
DENTAL PLAN

LEE D. CADY, M.D.

ST. LOUIS

According to a report of the economic committees of the Missouri State Dental Association and the St. Louis Dental Society, the Society has developed a plan to bring the profession into contact with low wage earning persons in need of dental service. The Society decided, after surveying the local situation, to direct efforts toward better dental health in the community.

The dental profession's duty to serve the public and at the same time retain professional independence was held obligatory. Without fulfilling the first requirement, they could expect to lose the other eventually. Many dentists do serve those who cannot pay, but that is not to be considered a complete professional defense against criticism.

It is maintained that health "socializers" who have urged voluntary and compulsory insurance schemes by "melodrama, subtle, half-truth and superficial argument" have never been able to give uncontroversial facts on the actuarial data of the situation. They never have found or devised a way or a plan to sell insurance on an illness or defect already present any more than new life insurance contracts are sold on the lives of those already dead. The dental profession felt that it must develop a plan whereby the low wage groups may receive dental service or that task might be attempted by other agencies. "The profession must rededicate itself to the principle of serving people according to their needs rather than in accordance with their affluence." The difficult problem of educating the

public along lines of allotment of family budgets so that needed dentistry can be had must be solved without antagonism.

The Missouri Dental Plan operates through the Medical-Dental Service Bureau, Inc., of St. Louis and (1) serves to send the patient to the dentist of his choice, (2) arranges that the cost of service is in accordance with the patient's financial circumstances, (3) functions as a social service agency, and (4) educates the patient to his obligation toward the dental profession. The Bureau finances its operations from not more than 10 per cent of the patient's contribution. The dentist is under no compulsion to accept any patient and he can request that the social service survey of the patient be reviewed if he thinks there may be inaccuracies.

The plan functions briefly as follows:

The patient is referred directly to the Bureau by private and community social agencies, employers, dentist, physician or another patient. A preliminary social survey is made and the family dentist is consulted. The dentist examines the patient, reports the work necessary and the fee which usually would be charged. The social survey is usually completed by that time and the patient is classified. The dentist is then acquainted with the patient's financial status and he may accept or reject the patient on the basis of reported ability to pay. If accepted, the patient is required to sign an agreement to pay the sum which he is to budget. The payment is not called a fee and the patient is aware it is not a fee but a contribution to a fund through which low wage earning and indigent persons may receive treatment.

The plan has been in operation as an experiment for about ten months, and operates successfully in direct proportion to the aggressive leadership and enthusiasm on the part of the dental profession. It has already had three or four national notices. Participating dentists (more than 90 per cent of those approached) like it because it does not disturb private practice or fee schedules and because it maintains professional independence. It controls the number of applicants from employers or social agencies. It arouses an interest in the care of the teeth among those who can pay reasonable fees as well as those who approach indigency. It has proven that few persons really want free service and that they appreciate the opportunity to obtain service within their financial limits.

The plan is one of dental health education and promotes favorable public opinion. The dentist has found rather frequently that many low wage earning persons can refer patients who are financially ineligible for this service and can pay fair fees. Numerous patients are taught that wise budgeting may purchase dental health.

With this plan there is no basis for insistence that politically controlled compulsory dental health insurance is necessary. Ninety-two per cent of the financial obligation has been paid as agreed by the patients. Even social agencies make nominal pay-

ments for their cases. No one has interpreted the plan as a charity activity. Through it patients are less likely to take unfair advantage of the dentist's credulity. The advantage of keeping dental practice in the private office is obvious. No applicant truly eligible to be served under this plan has objected to the social survey. No one has advanced any serious objections based on fact.

It is true the plan has been criticized by some who do not understand it. It has been proven that the plan is practical. That it does work is sufficient proof. "People are the same everywhere, and dentists are the same everywhere; the only variable is the direction and activity of local leadership. Given identical leadership and the response in any city, county or state will be fundamentally the same."

The experiment was carried out by the personnel of the Medical-Dental Service Bureau, Inc., of St. Louis. The board members of the Medical-Dental Service Bureau are in position to watch it critically. The plan required a social service agency and since there was no more proper agency than the Medical-Dental Service Bureau, the Bureau served in that capacity. The Bureau can go into commercial concerns and other groups of people to explain the plan and to arrange for the prospective patient to get in touch with the dentist of his choice. There is no question of ethics to the practitioner and he can work under the reassurance of his own agency and social service survey. The dentist is, indeed, thereby rededicating his professional services to those who need them and he is making personal and professional friends among the public.

Approximately 600 persons have been treated and many others sent directly to their family dentists through the plan. The number served could well have been ten times greater, but it was decided to proceed slowly and cautiously until the plan either proved efficient or failed. Since the results thus far have been most favorable, the plan now is being given wider publicity. The economic committees of the St. Louis Dental Society and of the Missouri State Dental Association have instituted a plan which may well be of great interest to practicing physicians. The Missouri Dental Plan definitely has shown the usefulness of the Medical-Dental Service Bureau, Inc.

426 N. Taylor.

#### OCCUPATIONAL HAZARDS OF MORPHINE

Reporting four cases of skin eruptions due to contact with morphine, James W. Jordon, M.D., and Earl D. Osborne, M.D., Buffalo, in *The Journal of the American Medical Association* for Nov. 25, warn that contact with this drug and other opium derivatives constitutes an occupational hazard to such workers as nurses and employees of drug houses.

Three of their patients were nurses and the other was a tablet molder in a drug company manufacturing morphine.

"Our attempts at desensitization in morphine dermatitis have proved a complete failure, as have our attempts at desensitization in other cases of the contact type of dermatitis."



# THE JOURNAL

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JANUARY, 1940

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## EDITORIAL

### MEDICAL SERVICE IN THE UNITED STATES

Adequate medical care, while basically dependent on the ability and availability of physicians, also depends on transportation, means of communication, auxiliary personnel and facilities as nurses, technicians, hospitals and laboratories. These elements have increased rapidly in the United States and transportation and means of communication have improved until today this country compares well with other countries. It is possible for the physician of today to give good service to a larger number of persons than was possible during the last century.

The reduction in the number of low grade medical schools which reduced the total number of medical schools from 160 in 1900 to 77 at present attests the improvement in medical training and the ability of the physician. The other factor in good medical service, the availability of physicians, has been studied by the American Medical Association and data assembled by the Association shows that the supply of physicians in the United States has maintained a fairly uniform relation to a steadily increasing population during the last fifty-two years. In the period 1916 to 1929 the number of physicians did not increase as rapidly as the population, but since 1929 the supply of physicians has increased more rapidly than the population.

In 1886, with a population of 57,937,540, there were 87,520 physicians, or 662 population per physician. In 1938 with a population of 130,215,000, there were 169,628 physicians, or 768 population per physician. The greatest population per physician was in 1929 when there were 797 persons per physician. The lowest was in 1890 with 629 persons per physician.

The number of physicians in the United States in 1938 was greater by approximately 19,000 than the combined number of physicians in Great Britain, Germany, France, Poland, Denmark, Sweden, Norway, Switzerland, Belgium and Holland. The combined population of these countries exceeds the population of the United States by 90,000,000. Pop-

ulation per physician in some of these countries is: England, 1,069; Germany, 1,307; France, 1,596; Poland, 3,100; Denmark, 1,346; Sweden, 2,600; Belgium, 1,460; Holland, 1,417.

In Sweden, often cited as having a model medical service, there is one physician for approximately every 2,600 persons. In the United States, where the frequent complaint that physicians are not as widely distributed as they should be and that some rural districts are lacking in physicians, there were only 241 counties in the entire country in 1936 that had more than 2,000 persons per physician.

The United States meets the requirements of ability and availability of physicians much better than the majority of countries. While favorable comparison does not take the place of perfection, it clearly indicates that attempts for perfection should not be based on the socialistic plans of European countries which fall short in a comparison with this country.

In a recent book, "The Health Insurance Doctor," by Barbara N. Armstrong, professor of law at the University of California, the author emphasizes that while the systems in use in England, Denmark and France operate smoothly in their native countries, to transfer them to this country would be nothing short of calamitous. Miss Armstrong points out that in England neither the specialist nor hospital treatment is included in the plan and any plan in this country must, if the present quality of service is maintained, make use of the available equipment, hospital facilities and the integrated teamwork of specialists.

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## NEWS NOTES

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Drs. G. E. Gruenfeld and S. H. Gray, St. Louis, spoke at the Trudeau Club of St. Louis on December 7 on "Congenital Anomalies of the Lung."

Dr. Edmund Lissack, Concordia, addressed the annual meeting of the Kansas City Social Hygiene Society in Kansas City on December 7 on "Well Born."

Appearing on the program of the St. Louis Surgical Society at its meeting December 20 were Drs. E. L. Keyes, I. C. Middleman, Max W. Myer, Harry Agress, J. G. Probst, N. W. Drey, Paul S. Lowenstein and Clarence T. Eckert, St. Louis.

Dr. Louis H. Hempelmann, St. Louis, was honor guest at a dinner celebrating the fiftieth anniversary of the Deaconess Hospital, St. Louis, on November 28. Dr. Hempelmann, the oldest staff member in years of service, was presented with a watch. Approximately two hundred persons including physicians, nurses and members of the board of directors attended the dinner.

Dr. Roland M. Klemme, St. Louis, gave an illustrated lecture on "The Surgical Treatment of the Violent Palsy of Paralysis Agitans," at Columbia, December 9, under the auspices of Tau Chapter of the Phi Beta Pi Medical Fraternity of Missouri University School of Medicine.

Dr. C. E. Burford, St. Louis, President-Elect of the Missouri State Medical Association, was the guest speaker at the annual initiation banquet of the Missouri chapter of Alpha Epsilon Delta recently at Central College, Fayette. His subject was "Some Shallow Excursions Into the Fringes of Medicine."

Dr. Morris Fishbein, Chicago, will speak on "Quackery in Medicine" at a public meeting at the St. Louis Medical Society Building, on January 30, under the auspices of the Missouri Social Hygiene Association, the Young Men's Division of the Chamber of Commerce of St. Louis and the St. Louis Medical Society.

Drs. August A. Werner and L. M. Riordan, St. Louis, were guests of the Macon County (Illinois) Medical Society at Decatur, Illinois, December 19. Dr. Werner spoke on "Influence of the Ductless Glands on Growth and Development" and Dr. Riordan discussed "Vaginal Discharges and Their Treatment."

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Nonofficial Remedies:

International Vitamin Corporation

I.V.C. Ascorbic Acid Tablets

I.V.C. Thiamin Chloride Crystalline Tablets,  
0.5 mg.

I.V.C. Thiamin Chloride Crystalline Tablets,  
1.0 mg.

I.V.C. Thiamin Chloride Crystalline Tablets,  
3.3 mg.

Mead Johnson & Co.

Mead's Mineral Oil with Malt Syrup  
New York Quinine and Chemical Works  
Nicotinic Acid—N. Y. Q.

Parke, Davis & Co.

Vitamin K in Oil

Capsules Vitamin K in Oil

The Wilson Laboratories

Gastric Mucin—Wilson

Gastric Mucin Powder—Wilson

Gastric Mucin Granules—Wilson

Winthrop Chemical Co., Inc.

Fuadin

Ampoules Solution Fuadin, 3.5 cc.

Ampoules Solution Fuadin, 5 cc.

Luminal-Sodium Tablets, 1 grain.

The following product has been accepted for inclusion in the List of Articles and Brands Accepted

by the Council But Not Described in N. N. R. (New and Nonofficial Remedies, 1939, p. 528):

Smith-Dorsey Co.

Tablets Ferrous Sulfate, 3 grains

Beginning July 1, 1940, there will be openings for assistant residents at the Ellis Fischel State Cancer Hospital, Columbia. Salaries will be \$35 monthly plus room, board and laundry. At least one year's previous internship is required. Appointments will be of rotating nature consisting of eight months in cancer surgery and four months in roentgen therapy and pathology. Applications, stating school and previous hospital experience, should be made to the Cancer Commission of the State of Missouri, 3713 Washington Blvd., St. Louis.

Seventeen members of the faculty of St. Louis University School of Medicine who have served for twenty-five years were honored at a dinner on November 30 sponsored by the Women's Club of the School of Medicine. Replicas of the seal of the university were presented to each of the honor guests. Those receiving the awards were Drs. Theodore Greiner, Joseph Grindon, Sr., Andrew C. Henske, H. H. Kramolowsky, Albert Kuntz, James F. McFadden, Fritz Neuhoft, Claude D. Pickrell, M. J. Pulliam, A. J. Raemdonck, Phil H. Scherer, E. T. Senseney, S. A. Weintraub, William Weiss, John Zahorsky. Dr. E. F. McCarthy and Dr. T. Wistar White were unable to attend the dinner.

The latest methods of diagnosing tuberculosis by means of roentgenograms of the lungs was discussed at a conference held in Jefferson City, December 15. Dr. Jesse E. Douglass, Webb City, President of the Missouri Tuberculosis Association, led the discussion. Among physicians participating in the conference were Drs. A. B. Cramb, Kirksville; E. R. Deweese, Kansas City; C. E. Hellweg, W. P. Maddux and J. A. Stocker, Mount Vernon; George H. Hoxie, Kansas City; George D. Kettelkamp, St. Louis; W. M. Kinney, Joplin; L. L. Latham, California; I. H. Lockwood, Kansas City; Paul Murphy, Koch; W. J. Sullivan, Kirksville, and E. E. Glenn, Springfield, Chairman of the Committee on Tuberculosis of the Missouri State Medical Association. Another conference is planned for some time in March. Physicians may obtain information from the Missouri Tuberculosis Association or the Missouri State Medical Association.

## ORGANIZATION ACTIVITIES

### ABSTRACT OF COUNCIL MINUTES

The Council of the Missouri State Medical Association met in Kansas City at the University Club on Sunday, November 26, 1939, at 10.30 a. m., Dr. Curtis H. Lohr, St. Louis, Chairman, presiding.



In attendance were Drs. A. S. Bristow, Princeton; H. B. Goodrich, Hannibal; Curtis H. Lohr, St. Louis; R. B. Denny, Creve Coeur; W. A. Bloom, Fayette; A. J. Campbell, Sedalia; E. P. Heller, Kansas City; H. L. Kerr, Crane; E. C. Bohrer, West Plains; E. J. Nienstedt, Sikeston, Councilors; James R. McVay, Kansas City, President; Cyrus E. Burford, St. Louis, President-Elect; R. L. Thompson, St. Louis, Treasurer; Walter Baumgarten, St. Louis, Chairman, Committee on Publication; Morris B. Simpson, Kansas City, Chairman, Committee on Public Policy; James E. Stowers, Kansas City, Chairman, Committee on Scientific Work; C. H. Neilson, St. Louis, Chairman, Committee on Post-graduate Course; D. A. Robnett, Columbia, Chairman, Committee on Cancer; G. Wilse Robinson, Sr., Kansas City, Chairman, Committee on Mental Health; Ralph R. Wilson, Kansas City, Chairman, Committee on Maternal Welfare and Infant Care; H. L. Mantz, Kansas City, Adviser to Woman's Auxiliary; Morris Ginsberg, Kansas City, Chairman, Council Special Committee on Refugee Physicians; Harry F. Parker, Jefferson City, State Commissioner of Health; John Aull, Kansas City; W. M. West, Monett, and Paul Forgrave, St. Joseph, members State Board of Health; Theodore C. Meyer, Clayton, Commissioner of Health, St. Louis County, Mr. F. K. Helsby, Executive Secretary, Jackson County Medical Society, and E. H. Bartelsmeyer, St. Louis, Secretary of the Council.

The minutes of the meetings held on May 14 and June 11, 1939, were approved as published in THE JOURNAL.

The President, Dr. James R. McVay, and the President-Elect, Dr. Cyrus E. Burford, addressed the Council.

The President reported the appointment of Dr. F. G. Thompson, St. Joseph, as a member of the Committee on Cancer to fill the unexpired term (1940) of Dr. Titus S. Lapp, Fulton, resigned. The appointment was confirmed.

The Chairman appointed Drs. H. B. Goodrich, A. S. Bristow and E. C. Bohrer as the Committee on Appropriations.

The report of the Treasurer was received and referred to the Committee on Appropriations as follows.

#### STATUS OF FUNDS

General Fund .....	\$2,930.77
Defense Fund .....	1,220.76
Public Relations Fund .....	1,561.99
Sinking Fund .....	4,269.00
Total .....	\$9,982.52

R. L. THOMPSON, Treasurer.

The report of the General Committee on Arrangements for the 1940 Joplin Session was submitted by Dr. H. L. Kerr, Chairman. The appointment of Dr. Paul W. Walker, Joplin, as Chairman

of the Local Committee on Arrangements was confirmed.

The report of the Committee on Publication as submitted by Dr. Walter Baumgarten, Chairman, regarding the publication of THE JOURNAL was approved. Dr. Baumgarten was elected Editor of THE JOURNAL and Mr. Bartelsmeyer designated as Managing Editor.

The appointment of Dr. C. T. Ryland, Lexington, as a member of the Committee on Publication was approved. The Chairman, Dr. Lohr, was authorized to appoint the fifth member of the Committee.

The report of the Committee on Cancer was submitted by Dr. D. A. Robnett, Chairman, and approved. It was urged that county medical societies which had not appointed local committees on cancer do so at once and notify headquarters office of the personnel of the committee.

The report of the Committee on Scientific Work was submitted by Dr. James E. Stowers, Chairman, and approved. It was reported an excellent scientific program was being arranged for the Joplin (1940) Session and that eight distinguished guest speakers had already accepted an invitation to address its session.

The report of the Committee on Public Policy as submitted by Dr. Morris B. Simpson, Chairman, was approved. On recommendation of the Committee on Public Policy the following resolution was approved:

WHEREAS, It has come to the attention of the Committee on Public Policy that there is a great demand for speakers to address various lay organizations, and

WHEREAS, Speakers should be drawn from medical groups and from the Woman's Auxiliary, and

WHEREAS, These speakers should be specially trained, be it

*Resolved*, That the Committee on Public Policy of the Missouri State Medical Association be given authority to cooperate with other interested committees of the Association, and its Auxiliary, to form, and if necessary train a group competent to make these talks to lay groups, and that as far as possible requests for speakers be referred to the Committee on Public Policy.

On recommendation of the Committee on Public Policy, the officers of the Association and the Committee on Public Policy were authorized to arrange two meetings of the presidents and secretaries of the component county medical societies at such times as may be determined.

The President, Dr. James R. McVay, reported the appointment of Drs. G. J. Tygett, Cape Girardeau; C. R. Bruner, Columbia, and C. Souter Smith, Springfield, as advisory members of the Committee on Conservation of Eyesight. The appointments were confirmed.

On recommendation of Dr. Bristow, Councilor of the First District, Atchison, Gentry, Nodaway

and Worth counties were hyphenated into one Society.

The report of the Committee on Maternal Welfare and Infant Care was submitted by Dr. Ralph R. Wilson, Chairman, and approved.

The report of the Committee on Postgraduate Course was submitted by Dr. C. H. Neilson, Chairman, and approved.

Dr. Harry F. Parker, State Commissioner of Health, spoke on the nine point health program of the State Board of Health, and the manner in which federal and state funds are matched and allocated for various programs sponsored by the State Board of Health.

The report of the Special Council Committee on Refugee Physicians was submitted by Dr. Morris Ginsberg, Chairman, and referred to the Committee on Public Policy.

On motion, the Council recommended to the House of Delegates that Dr. J. M. Russell, Monett, member of the Barry County Medical Society, be nominated for Affiliate Fellowship in the American Medical Association.

On motion the Council authorized a \$50 contribution to the Woman's Auxiliary to assist in defraying the expenses of the Essay Contest and convention expenses of the Auxiliary.

The Secretary discussed the platform of the A. M. A. as published in the December issue of *THE JOURNAL* and reported on the proceedings of the Annual Conference of Secretaries of Constituent State Medical Associations held in Chicago, November 17 and 18, 1939.

The Council accepted the invitation of Radio Station KFUE to broadcast a series of programs over this Station at such time as may be arranged for by the Council's Special Committee.

Cooperation with the Federal Trade Commission, Washington, D. C., in the matter of suits to restrain false and misleading advertising was approved.

On recommendation of the Committee on Appropriations the following budget for 1940 was approved:

#### REPORT OF COMMITTEE ON APPROPRIATIONS

To the Council:

Your Committee recommends the following as the Budget for 1940:

Salaries (Office and <i>JOURNAL</i> )	.....\$12,500.00
Printing of <i>THE JOURNAL</i>	..... 7,000.00
Public Relations	..... 2,000.00
Defense	..... 1,000.00
Postage	..... 700.00
Postgraduate Instruction	..... 1,200.00
Printing and Stationery	..... 700.00
Traveling Expenses of Executive Secretary	..... 1,100.00
Telephone and Telegraph	..... 600.00
Rent of Office and Light	..... 1,200.00

Meetings:

Annual Session	
Council and Councilors	
Expenses	..... 3,000.00
Committee Meetings and Conferences	
Delegates to A. M. A.	
General Expense and Miscellaneous	..... 750.00
	<hr/> \$31,750.00

Complete reports of committees and all other actions of the Council will be submitted to the House of Delegates at the Joplin Session.

#### THE NATIONAL PHYSICIANS' COMMITTEE

The National Physicians' Committee for the Extension of Medical Service was launched officially by a formal meeting of its executive board in Chicago on November 18. The organization was formed to maintain the ethical and scientific standards and preserve the independence of American medicine and to best serve public interest by "(1) Make possible the providing of medical service to the indigent and those in the low income groups, and insure the most widespread distribution of the most effective methods and equipment in medicine and surgery. (2) Assume the responsibility of countering destructive propaganda by familiarizing the public with the facts in connection with the methods and the achievements of American medicine."

The Committee is described in the *Journal of the American Medical Association* of December 2 as follows: "A central committee of more than 800 physicians is being formed, in which all the states will be represented. The organization is an independent one, not affiliated in any way whatever with the committee sponsored by Mr. Frank Gannett under the management of Dr. Edward A. Rumely or with the so-called Committee of Physicians or with the American Medical Association. The functions will not, it is stated, overlap or infringe on those of existing county, state or national medical organizations. For its finances, this organization depends wholly on voluntary contributions from physicians, dentists, nurses, hospitals, pharmacists and lay groups interested in the maintenance of the private practice of medicine.

"A broad gage nationwide educational program has been planned and the preliminary steps have been taken to put it in operation. An effort will be made to familiarize the public with the aims, the methods and the effectiveness of American medicine. It is believed that this will result in generally improving health conditions and will tend to offset propaganda that is altering the point of view of the individual and adversely affecting the status of the physician."

The reasons for organizing the National Physi-



cians' Committee are stated in a pamphlet concerning the organization as follows: "Medicine is confronted with two new conditions. On the one hand, widespread unemployment, low farm income, and the continuation of conditions of general depression have made it difficult for an ever increasing number of people to pay for the best medical service and proper hospitalization out of earnings.

"On the other hand, there is the trend—worldwide in scope—toward governmental paternalism and the false, suicidal doctrine that the 'state' can provide a service and a security that the people cannot otherwise obtain. As related to medicine, the implementing of this concept would effect revolutionary changes in both the practice of medicine and the underlying philosophy which has given it the dynamic quality that resulted in worldwide leadership."

The pamphlet states that initially the Committee will advocate "(1) the maintenance of independent private medical practice; (2) the preservation and extension of our independent hospital system; (3) the centralization of all health services of federal and state governments; (4) the determination of health requirements on the basis of locally gathered and locally interpreted data and the utilizing of grants-in-aid only under conditions of locally demonstrated needs, and (5) control and disbursement of public health funds by administrators locally appointed or locally elected."

A resolution adopted by the directors sets forth the objectives: "Resolved, That the National Physicians' Committee for the Extension of Medical Service is a nonprofit, nonpolitical organization for maintaining ethical and scientific standards and extending medical service to all the people . . . and for . . . cooperating with lay and medical institutions and groups, interested in the preservation of national health, to make more generally known the achievements and to safeguard the independence of American medicine."

Dr. Edward H. Cary, Dallas, is chairman of the executive board; Dr. Austin Hayden, Chicago, is secretary, and Dr. N. S. Davis, Chicago, treasurer. Drs. Alphonse McMahon, St. Louis, and E. H. Skinner, Kansas City, are members of the executive board. Other members of the Committee from Missouri are Drs. Paul Forgrave, St. Joseph; Robert E. Schlueter, St. Louis, and Frank D. Dickson, Kansas City. The office of the Committee has been established at 700 Michigan Avenue, Chicago, and Mr. John M. Pratt is executive administrator.

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## THE STATE BOARD OF HEALTH

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A new protective measure for public health has been launched by the State Board of Health through the enforcement of a state regulation requiring all food handlers to file annual health certificates. This regulation applies outside of St. Louis, Kansas City

and St. Joseph, these cities having their own periodic health examinations.

Under this program any person occupied in any line of food handling is required to have an annual physical examination by the physician of his own choice. It is compulsory that all examinations include a blood test for syphilis made by the State Board of Health Laboratory, a local health department or a private laboratory approved by the State Board of Health. Supplies for tests made by the State Board of Health Laboratory are furnished free upon request of licensed physicians.

Physical examination blanks for food handlers are being distributed by inspectors of the State Food and Drug Division and by district health officers throughout the state. The following procedure has been outlined. The food handler goes to his physician's office. The blood specimen is taken first so it may be forwarded to the laboratory. The physician completes the history and physical examination but holds the examination form until the laboratory report has been received. The physician then copies the serial number from the laboratory report on the examination blank with a notation, negative or positive, and sends the completed report to the Food and Drug Division of the Board of Health to become a permanent record. If the employee is found by his physician to be free from any venereal, infectious or contagious disease, a small card attesting to this fact is issued and forwarded to the examining physician for his signature. The card is then delivered to the food handler who in turn files it with his employer. These cards are subject to inspection by representatives of the Food and Drug Division.

The Health Department is gratified by the cooperation of business houses, food handlers and particularly the practicing physicians throughout the state who are largely responsible for the success of this program.

The sanitation program does not stop with food handlers but includes also an inspection of restaurants and other business houses with respect to cleanliness of dishes, cooking utensils, refrigerators, floors, shelving and other equipment which may in any way contaminate food or drugs. The public can help materially by demanding clean food and patronizing only those restaurants and stores that take proper precautions.

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Under the provisions of House Bill 189 passed by the last legislature, the law relating to the State Board of Barber Examiners was amended to require an annual physical examination of all barbers to show them free from infectious or contagious diseases. A further provision of the bill required that the physician for these examinations in each community be designated by the State Board of Health. This latter provision was added by amendment to the original bill when it was before the Senate for discussion and passage and the

State Board of Health was not appraised of it until recently.

While the legislative intent was no doubt good, yet the State Board of Health has never attempted to dictate the choice of one licensed physician over another as it has always been the policy of the Board of Health to have each person choose his own physician with the one proviso that he be a duly licensed physician in the state. This policy is borne out in the examinations now being conducted through the Food and Drug Division of the State Board of Health as described above.

To allay any misunderstanding regarding the interpretation of the function of the State Board of Health in the examination of barbers, the State Board in regular session on December 9 passed the following resolution:

WHEREAS, It has come to the attention of the State Board of Health that under the provisions of a law, passed by the 60th General Assembly, amending the law in regard to the State Board of Barber Examiners, a new section was added requiring all barbers of the state to have an annual physical examination to show them free from infectious and contagious diseases,

WHEREAS, Under said law the State Board of Health is required to designate physicians in each community to carry out such physical examinations, and

WHEREAS, It is the policy of the State Board of Health to allow every person the free choice of his physician in all instances with the proviso that he be a licensed physician under the laws of the State of Missouri, now therefore be it

*Resolved*, That the State Board of Health hereby designate any duly licensed physician of the state to carry on said examinations and to report their findings to the State Board of Barber Examiners on the prescribed form as approved by the State Board of Health.

The new state regulations requiring the physical examination of food and drug handlers and of barbers is increasing greatly the work of the State Laboratory. In order to insure more expeditious handling of specimens, the State Board of Health is formulating a plan for the approval of local health departments and private laboratories for work on serology of syphilis which work, under the present regulations, must be carried out under the supervision of the State Board of Health.

To obtain approval for the private laboratory the same methods are used as those in use by the United States Public Health Service. This method consists of the State Laboratory sending known bloods under number to the private laboratory for test and in checking the results of these tests against the findings of the State Laboratory. Agreement of the two findings will be necessary to obtain approval by the State Board of Health Laboratory. A number of private laboratories already have received approval for these tests and their findings are accepted by the Health Department. Private laboratories should use their own mailing containers for tests in all instances.

A 290 page annual report covering the activities of the State Health Department for 1938 is just off

the press. This report contains a review of the achievements of each division together with a large number of illustrative maps, charts and graphs which show in pictorial form the progress that has been made in public health work in Missouri within the year. Nearly half of the volume is devoted to tables on vital statistics.

A limited supply of annual reports has been reserved for physicians throughout the state. Requests should be addressed to the Division of Public Health Education.

The attention of physicians is called to a new ruling made by the State Board of Health in its last regular session to the effect that five months be the minimum reportable gestation period for reporting a stillbirth in the State of Missouri. Under this ruling Missouri's figures on stillbirths will be comparable with other states.

Birth and death certificates have been combined for reporting stillbirths, which will save time for physicians. The new forms call for causes of stillbirth. This information heretofore has not been available in Missouri.

In an address to the Central Society for Obstetrics and Gynecology in Kansas City recently, Gov. Lloyd C. Stark reported the rather significant decline in the infant and maternal death rates in Missouri.

"Last year 3,032 infant deaths were reported, representing a rate of 51.07 deaths per thousand live births as against a rate of 56.89 the previous year. More striking than that is the maternity mortality rate which declined from 5.13 per thousand in 1937 to 3.82 in 1938," stated Governor Stark.

Describing in some detail the work of the State Health Department in maternal and child hygiene, the Governor said, "In every sense of the word this work is of an educational nature, the aim being to create the desire for adequate medical care leaving to the private physician the performance of medical service."

## BOOKS FOR LEISURE MOMENTS

### TWENTIETH CENTURY HARLOTRY AND THE ADOLESCENT

Courtney Ryley Cooper who has spent several recent years reporting crime for America now offers "Designs in Scarlet" Little, Brown & Company, Boston). The book is aptly titled but it is more than a design. It is a disgusting pattern of modern America, or that portion of it into which the author wandered during his search for material. If that material is true, if it is presented in true perspective and does not merely magnify a long existent evil, it is time for some kind of official investigation.

Prostitution is generally considered as old as the world. Until a recent time it was managed on a small scale in a restricted area. Now, according to Cooper, it



has blossomed forth overnight as a Hydra headed monster slowly but surely engulfing more than its quota of young womanhood. It is open but not above board. It is a big time business, made so perhaps as an aftermath of prohibition. At any rate, many of its most progressive figures are retired whiskey runners.

The girls come from everywhere, earning a living for their pimps by debauchery, engulfed by them and their profession, herded and traded in like cattle.

We hope that the actuality is not as bad as the author would have us believe. Perhaps his book is possible as a publishing venture only because venereal diseases have advanced to a certain social recognition, because the terms having to do with them may now be uttered.

Even the author cannot estimate the social consequences of this new and widespread venery. No one can doubt the existence of the institutions which he describes as rampant over the land—at least sixty of them between Kansas City and St. Louis, one every thirty to forty miles. But one may question the promiscuity which he declares as rampant as the opportunities for it. For these reasons it is impossible to assess the volume properly. But it is worth reading for the informative presentation of the modern setting of the age-old vice.

B. Y. G.

#### DESERVING OF A WIDE RECEPTION

A number of medical organizations have been in the habit of offering lectures to the general public to better acquaint them with the scientific background of medicine. From time to time such lectures appear in book form. No better job has been done than the series just published by the faculty of the Harvard Medical School under the editorship of William H. Robey, Clinical Professor of Medicine, Emeritus, under the title, "Health at Fifty" (Harvard University Press, Cambridge). There are a dozen lectures which may profitably be read by every physician and layman in America.

Blumgart on heart disease, Soma Weiss on blood pressure, Bauer on rheumatism, Wolbach on vitamins, Aub on the endocrines, Macific Campbell on mental health, are some of the subjects which constitute the volume. The chapter on menstruation by John Rock, research associate in obstetrics, is the finest exposition of the complex endocrinology of the menstrual cycle that I have ever read. It leaves out none of the elaborate concepts introduced by the average textbook. At the same time it develops a picture that is crystal clear and satisfactorily related to the realities of the cycle experienced by every woman. Adequate illustrations further the ease with which the reader may grasp the author's meaning.

The entire volume is characterized by clarity of concept, forcefulness of expression, a proper scientific approach and a literary style that compels further reading; yet there is no sermonizing. No contributor takes time to lambast the cults or to extol the virtues of scientific medicine. It is straight exposition and should prove effective in spreading the knowledge of medicine.

There should be more volumes like this for one of the prime needs of the present day is effective vehicles to carry the story of medicine and the profession to the people. In that way better than any other we can arouse the consciousness of the people and preserve the heritage of American medicine. Physicians will do well to see that their patients read "Health at Fifty" for the good that it will do the whole community.

B. Y. G.

#### ON BECOMING A DOCTOR

The Frederick A. Stokes Company of New York has entered the field of vocational guidance counselling with

a series of books, the present volume under the title, "Do You Want to Become a Doctor?" This volume by Dr. Morris Fishbein describes the technical requirements for entrance into a medical school, the process of internship, the acquisition of a license, and the practice of medicine. Due consideration is accorded the so-called accessory professions and the technical operation of adjuncts to the physician. Two chapters deal with the social and economic aspects of practice, together with its relationship to government.

B. Y. G.

#### BIBLIOGRAPHY

The Johns Hopkins Press makes available a short account of the life and works of one "John Howard," who died in 1790. Hereditarily wealthy he devoted himself to travel and pleasure, became attracted to the intolerable conditions of the goals and lazarettos, wrote voluminously upon them. He is credited with initiating a considerable reform in the operation of the former and through his efforts for the latter with inaugurating the public health movement. Dr. Leona Baumgartner has taken pains to collect the titles of all his published works together with their present location.

B. Y. G.

#### NEW EDITION OF AN OLD CLASSIC

Richard von Krafft-Ebing (1840-1902) was the pioneer in the elucidation of anomalies of the sexual life. As professor of psychiatry and neurology at the University of Vienna he became aware of the injustices sometimes meted out to persons who transgressed the sexual code. He did not condone their excesses but he insisted that they were to be considered as victims of disease rather than as criminals. In a single large volume "Psychopathia Sexualis" he collected a large series of case histories of these persons together with his interpretation of their underlying motivation. More important, perhaps, he pointed out that many of them were amenable to treatment if not to cure.

In the hope that the volume would convey solace and social elevation to its readers Krafft-Ebing brought out edition after edition of his work. In the preface to the twelfth edition he wrote, "Its (the book's) commercial success is the best proof that large numbers of unfortunate people find in its pages instruction and relief in the frequently enigmatical manifestations of sexual life. The hosts of letters that have reached the author from all parts of the world substantiate this assumption. Compassion and sympathy are strongly elicited by the perusal of these letters, which are written chiefly by men of refined thought and of high social and scientific standing. They reveal sufferings of the soul in comparison to which all the other afflictions dealt out by Fate appear as trifles."

For this reason the Pioneer Press (Radio City), New York, have reprinted the twelfth edition of this early classic. Confined to the proper hands its circulation should do good.

B. Y. G.

#### HOW TO AVOID AIR SICKNESS

"Neither rich, heavy nor gas-producing foods should be eaten just before or during an airplane flight," the November issue of *Hygeia* declares in a discussion of the prevention of air sickness. "An alkaline effervescent drink is helpful and is usually found on board. Frequent swallowing until the ears are cleared makes for more general comfort. Chewing gum may make swallowing easier.

"Looking out at the horizon accentuates dizziness; hence, one so threatened should close the eyes or fix them on some point in the cabin."

## COUNCILOR DISTRICT AND SOCIETY PROCEEDINGS

### COUNTY SOCIETY HONOR ROLL FOR 1940

(UNDER THIS HEAD WE LIST SOCIETIES WHICH HAVE  
PAID DUES FOR ALL THEIR MEMBERS)

#### HONOR ROLL

Chariton County Medical Society, December 5, 1939.

Perry County Medical Society, December 11, 1939.

Camden County Medical Society, December 18, 1939.

Miller County Medical Society, December 20, 1939.

Ste. Genevieve County Medical Society, December 22, 1939.

Clinton County Medical Society, December 23, 1939.

ASSOCIATE EDITORS: COUNCILORS OF THE  
TEN COUNCILOR DISTRICTS

#### FIRST COUNCILOR DISTRICT

A. S. BRISTOW, PRINCETON, COUNCILOR

Atchison-Gentry-Nodaway-Worth Counties  
Medical Society

The first meeting of the Atchison-Gentry-Nodaway-Worth Counties Medical Society was held in Maryville, December 4.

Following a dinner at the Hotel Linville the scientific program was presented at the St. Francis Hospital.

Dr. J. Dewey Bisgard, Omaha, assistant professor of surgery, University of Nebraska College of Medicine, spoke on "Treatment of Fresh Traumatic Wounds."

Dr. J. Jay Keegan, Omaha, chairman of the department of surgery, University of Nebraska College of Medicine, discussed "Skull Fractures and Their Treatment."

The following officers were elected: President, Dr. Clifton M. Waugh, Tarkio; vice president, Dr. Samuel E. Simpson, Stanberry; secretary-treasurer, Dr. Charles D. Humberd, Barnard.

Sixty members and guests were present.

CHARLES D. HUMBERD, M.D., Secretary.

#### Grundy-Daviess Counties Medical Society

The Grundy-Daviess Counties Medical Society met December 5.

The following officers were elected for 1940: President, Dr. Robert V. Thompson, Jamesport; vice president, Dr. William A. Fuson, Trenton; secretary and treasurer, Dr. Edgar A. Duffy, Trenton; delegates, Drs. Edgar J. Mairs, Trenton, and Edward E. Nixon, Gallatin; alternates, Drs. Ola R. Rooks, Trenton, and Frederick Wilson, Winston; censors, Drs. Bertha E. Sheetz, Oliver F. Duffy and Charles H. Cullers, Trenton.

The Group Hospital plan was unanimously endorsed.

E. A. DUFFY, M.D., Secretary.

#### SECOND COUNCILOR DISTRICT

H. B. GOODRICH, HANNIBAL, COUNCILOR

#### Chariton County Medical Society

The Chariton County Medical Society met in Salisbury at 7:00 p. m. November 28 with the Linn County Medical Society and several physicians from neighboring towns as guests.

After a banquet, the president, Dr. W. D. West, Mendon, called the Society to order for the scientific program.

Dr. D. D. Stofer, Kansas City, spoke on "Sulfanilamide and Related Compounds."

Dr. G. Wilse Robinson, Kansas City, talked on "Mental Health."

The following officers were elected: President, Dr. Charles D. Stratton, Rothville; vice president, Dr. Andrew L. Lewis, Sumner; secretary-treasurer, Dr. George W. Hawkins, Salisbury; delegate, Dr. Charles D. Stratton, Rothville; alternate, Dr. John W. Hardy, Sumner; censors, Drs. Harry E. Tatum, Brunswick, Florian L. Harms, Salisbury, and Ulyses G. Buck, Rothville.

Those present were Drs. W. D. West and W. B. Lucas, Mendon; C. D. Stratton, Rothville; J. D. McAdam, Prairie Hill; J. W. Hardy and A. L. Lewis, Sumner; W. J. Billeter, Bynumville; H. E. Tatum, Brunswick; R. P. Price, Triplett; F. L. Harms and G. W. Hawkins, Salisbury; G. B. Putman, W. W. Ellis, M. L. Diekroeger and P. L. Patrick, Marceline; S. T. Brownfield, J. Lane Evans, Roy R. Haley, L. J. Pierce, Brookfield; J. R. Dixon, Linneus; T. S. Fleming and M. P. Hunter, Moberly; J. W. Gardner and W. B. Kitchen, Glasgow; D. D. Stofer and G. Wilse Robinson, Kansas City.

G. W. HAWKINS, M.D., Secretary.

#### FIFTH COUNCILOR DISTRICT

W. A. BLOOM, FAYETTE, COUNCILOR

#### Boone County Medical Society

The Boone County Medical Society met at the Boone County Hospital at 7:45 p. m. on November 7.

The secretary presented the request of the Metropolitan visiting nurse for Society approval of suggested routine orders to govern her action prior to the arrival of a physician on the respective cases which she visits. This was referred to the committee on lay organization.

Dr. D. A. Robnett announced that because of a lack of available funds for the purpose, all charity work will be discontinued at the Boone County Hospital until January 1, 1940.

It was decided that the Society should take up the matter of Group Hospital Service for its own members and that the secretary should determine the number of members desiring such coverage.

Dr. David LeMone, Columbia, presented roentgenograms of several cases of diagnostic interest. Dr. W. B. Brown, Columbia, discussed some of the cases.

#### Meeting of December 5

The Society held its annual dinner meeting and election of officers at the Stephens College Country Club at 6:30 p. m., December 5. The Society was the guest of Dr. James Wood, President of Stephens College. Thirty-six members and guests were present. After an enjoyable dinner the meeting was called to order by the president, Dr. E. D. Baskett.

The secretary announced that the Phi Beta Pi medical fraternity was sponsoring an illustrated lecture by Dr. Roland M. Klemme, St. Louis, December 9, on "Brain Surgery."

The application of Dr. Hurley E. Motley was referred to the board of censors.

The following officers were elected: President, Dr. Frank E. Dexheimer; vice president, Dr. Karl D. Dietrich; secretary-treasurer, Dr. Maurice E. Cooper



(reelected); member, board of censors, Dr. Dudley A. Robnett (reelected); member auxiliary committee on public policy, Dr. Carl M. Sneed (reelected).

Dr. W. W. Bauer, Chicago, Director of Health Education, American Medical Association, and Associate Editor of *Hygeia*, spoke on "Doctors as Health Teachers." He pointed out the numerous opportunities that exist at the present time for physicians to contribute to education of the laity in matters of health interest and the various media available as newspapers, radio and addresses. He pointed out that this form of advertising was the only ethical type open to medical societies as groups. The address was discussed by Drs. M. Pinson Neal, W. B. Brown, Carl M. Sneed and Frank G. Nifong.

The secretary was instructed to convey the appreciation of the Society to Dr. James Wood for his hospitality and express its hearty approval of the efforts Dr. Wood has put forth in the development of health activities at Stephens College.

Dr. Baskett spoke briefly of his appreciation for the support of his administration throughout the last year.

M. E. COOPER, M.D., Secretary.

#### Howard County Medical Society

The Howard County Medical Society met at the Lee Hospital, Fayette, December 1, with all active members present except Dr. D. Lee Coffman, Fayette. Dr. W. B. Kitchen, Glasgow, presided.

Dr. F. H. Lundgren, Fayette, was unanimously elected to membership.

Officers were reelected as follow: President, Dr. W. B. Kitchen, Glasgow; secretary, Dr. W. J. Shaw, Fayette. Dr. Kitchen appointed a cancer committee.

Dr. W. A. Bloom, Fayette, read an illustrated paper on "Trends in the Treatment of Pneumonia." The paper was discussed by Dr. J. W. Gardner, Glasgow.

The Society initiated plans for a Fifth Councilor District meeting to be held at Fayette in February.

W. J. SHAW, M.D., Secretary.

#### SIXTH COUNCILOR DISTRICT

A. J. CAMPBELL, SEDALIA, COUNCILOR

##### Pettis County Medical Society

The Pettis County Medical Society met in Sedalia on December 4.

The following officers were elected: President, Dr. Archie L. Walter, Sedalia; vice president, Dr. Frank B. Long, Sedalia; treasurer, Dr. Alfred E. Monroe, Sedalia; secretary, Dr. Charles H. Brady; delegate, Dr. Charles D. Osborne; alternate, Dr. David P. Dyer; censors, Drs. Milton P. Shy, Cord Bohling and A. J. Campbell, Sedalia.

A. L. WALTER, M.D., Secretary.

#### SEVENTH COUNCILOR DISTRICT

E. P. HELLER, KANSAS CITY, COUNCILOR

In connection with the report on the Public Health Committee of the Forward Kansas City Committee published in the December *JOURNAL*, the stipulation of the Council of the Jackson County Medical Society concerning the requirements for the director of public health were misquoted. The requirements specified that the incumbent should hold degrees of M.D. and Dr. P.H., rather than M.D. and Ph.D. The present incumbent holds these degrees.

#### TENTH COUNCILOR DISTRICT

E. J. NIENSTEDT, SIKESTON, COUNCILOR

##### Cape Girardeau County Medical Society

The Cape Girardeau County Medical Society met at the Colonial Tavern, Cape Girardeau, at 8 p. m. on

December 11. No scientific program was planned as officers were to be elected.

Dr. J. H. Cochran, Cape Girardeau, presided. Members present were Drs. Glenn J. Tygett, M. H. Shelby, C. T. Herbert, G. W. Walker, H. L. Cunningham, F. W. Hall, D. B. Elrod, J. W. Berry, D. H. Hope, W. F. Oehler, R. A. Ritter, P. B. Nussbaum, O. L. Seabaugh, and C. A. W. Zimmermann, Cape Girardeau; E. R. Schoen and D. I. L. Seabaugh, Jackson, and Edward Crites, Sedgewickville.

A communication from the Executive Secretary of the Missouri State Medical Association was read. It referred to a request by the Federal Works Progress Administration that physicians assist in the operation of the revised regulations of the Employees Compensation Commission. The communication was ordered received and filed.

Another letter from the Association requesting consideration of advertisers in *THE JOURNAL* was read and filed.

Correspondence of the National Physicians' Committee for the Extension of Medical Service was placed before the Society. The treasurer was ordered to contribute \$10 to the committee.

After considering a communication from the executive committee of the Prenatal Blood Test Bill, it was voted that an accompanying resolution be adopted, signed and returned.

After discussing the question of fees for examining food handlers a minimum fee of \$3 was agreed upon.

Drs. D. B. Elrod, F. W. Hall and W. F. Oehler were appointed to audit the books and found the treasurer's accounts correct and in order.

The following officers were elected: President, Dr. C. T. Herbert, Cape Girardeau; vice president, Dr. F. W. Hall, Cape Girardeau; secretary, Dr. C. A. W. Zimmermann, Cape Girardeau; treasurer, Dr. M. H. Shelby, Cape Girardeau; member board of censors, Dr. D. B. Elrod, Cape Girardeau; delegate, Dr. C. A. W. Zimmermann, Cape Girardeau; alternate, Dr. G. W. Walker, Cape Girardeau.

C. A. W. ZIMMERMANN, M.D., Secretary.

#### St. Francois-Iron-Madison-Washington-Reynolds County Medical Society

The St. Francois-Iron-Madison-Washington-Reynolds County Medical Society met November 29 at 7:30 p. m. at the Courthouse, Farmington.

Dr. Stanley Harrison, St. Louis, gave an excellent discussion on "Sulfanilamide and Sulfapyridine Therapy." He reviewed the literature and gave an excellent discussion of special cases at the Children's Hospital and City Hospitals. Informative lantern slides were presented and excellent discussion followed.

Dr. A. J. Cone, St. Louis, gave a splendid talk on "Difficulties and Diagnosis of Ear Infection After the Use of Sulfanilamide and Sulfapyridine." He particularly stressed that sulfapyridine frequently covers up latent infection and stated that it would be more necessary than ever to have a careful follow-up on all patients. An excellent discussion followed.

It was decided to hold the next meeting at the State Hospital and that the meeting consist of a presentation on a scientific subject and another talk dealing with developing better relations between the medical profession, the press and the public. The meeting will be held December 20 or 29. The editors of the local papers of the five counties are to be invited to attend.

No definite action was taken concerning approval of a bill pending concerning tests for syphilis in all obstetrical and gynecological cases.

G. TIVIS GRAVES, M.D., Secretary.

## WOMAN'S AUXILIARY

### WOMAN'S AUXILIARY TO THE AMERICAN MEDICAL ASSOCIATION

18th Annual Meeting, New York

President, Mrs. Rollo K. Packard, Chicago.

### WOMAN'S AUXILIARY TO THE MISSOURI STATE MEDICAL ASSOCIATION

16th Annual Meeting, Joplin

President, Mrs. Paul F. Cole, Springfield.

President-Elect, Mrs. Stanley P. Howard, Jefferson City.

Adviser, Dr. Herbert L. Mantz, Kansas City.

#### National Board Meeting

The Board of Directors of the National Auxiliary held their Board meeting at the Palmer House, Chicago, November 17, with seven officers, three directors, eight chairmen of standing committees and fifteen state presidents in attendance. Missouri was also represented by Mrs. A. B. McGlothlan, St. Joseph, who is chairman of revisions.

The meeting was opened by the president, Mrs. Rollo K. Packard.

The reports of the activities of the various states were many and varied including scholarship funds, essay contests, memorial funds, child welfare work, educational campaigns, philanthropic work and many others. All stressed *Hygeia* and educational programs.

The historian was authorized to compile a history of the last five years. This with the first twelve years is to be made into a complete history. The budget committee will set aside a sum as they see fit for publishing the history.

The finances of the organization were reported to be in good condition with a balance of \$4,639.03.

The president announced that the advisory committee has recommended that some of the allowance for the president's traveling be used to employ an executive secretary with offices in Chicago. The committee felt that the organization is large enough to be conducted in a business like way and that the records should be kept in a central place. Mrs. Packard thought it unnecessary for the president to attend so many meetings, especially the state board meetings.

It was decided that there would be no Southern breakfast at the 1940 meeting.

The public relations chairman announced that information had come that the American Federation of Women's Clubs is attempting to secure approval of the Wagner Bill or some similar measure by as many as possible of all the women's organizations affiliated with the Federation. This movement appears to have been designed for the purpose of bringing a concerted effort to bear on Congress for the enactment of the Wagner Bill or similar bill establishing a national health program.

Mrs. Packard had the secretary read from the constitution the article which forbids any auxiliary from becoming affiliated with any other organization.

The *Hygeia* chairman spoke of the contest now being conducted. She stressed the importance of interesting parent-teacher groups and placing *Hygeia* in schools and beauty parlors.

Plans for the meeting in New York next year were discussed. There is no auxiliary in New York City but the state has an active organization. The committee feels that there need not be much entertainment planned as the Fair and New York City are attractions.

Mrs. G. Scott Towne, president of the New York Auxiliary, said that they could not hope to equal the lovely entertainment St. Louis sponsored but that they would do the best they could to insure a good convention.

A delicious luncheon was served after which Miss Jean McArthur, secretary of the Educational Committee of the Illinois State Medical Society, told how their speakers' bureau is being conducted.

This was my last opportunity to represent Missouri on the National Board. The privilege of attending has been an honor and a pleasure. My association with this fine group of women will always be a source of inspiration to me.

MRS. PAUL F. COLE, President.

## BOOK REVIEWS

**PROCTOLOGY FOR THE GENERAL PRACTITIONER.** By Frederick C. Smith, M.D., M.Sc., (Med.); F.A.P.S., Proctologist to St. Luke's and Children's Hospitals, Philadelphia. Illustrated with 142 half-tones and line engravings and three color plates. Philadelphia: F. A. Davis Company. 1939. Price \$4.50.

"Proctology for the General Practitioner" by Dr. Frederick C. Smith is one of those books that follow a trend on specialties that are receiving publicity.

Some of the treatment is original but the subject matter on the whole follows previous publications on the subject of proctology. However, the book is worthwhile to the general practitioner as it points out conditions of the anorectal region that the general practitioner probably did not know existed and attempts to outline, without going into detail, modes of treatment for various anorectal conditions.

This book could be labeled a "handbook" on proctology if the subject matter were condensed. This book is not for the specialist in proctology. S. J. F.

**STANDARD BODYPARTS ADJUSTMENT GUIDE.** Traumatic Injuries, Medical Fees, Evaluations. Chicago: Insurance Statistical Service of North America. Copyrighted 1939. Price \$8.00.

This is a rough draft of anatomy, occupational diseases, evaluation of disability and compensation acts that adds little to the field of industrial medicine and surgery. Most of its definitions are not more than those found in a medical dictionary.

The evaluation of disabilities is different in most states as set out in their Workmen's Compensation Laws so that ones contained in this book would be of little help to a physician or layman in determining a particular case disability.

In the table of medical fees, some are acceptable, others are inadequate. E. C. F.

**VARICOSE VEINS.** By Alton Ochsner, B.A., M.D., D.Sc., (Hon.), F.A.C.S., William Henderson, Professor of Surgery and Director of the Department of Surgery, School of Medicine, Tulane University of Louisiana, New Orleans, Louisiana, and Howard Mahorner, B.A., M.D., M.S., (Surgery), F.A.C.S., Assistant Professor of Surgery, School of Medicine, Tulane University of Louisiana, New Orleans, Louisiana. With fifty text illustrations, two color plates. St. Louis: The C. V. Mosby Company. 1939. Price \$3.00.

This is the best book that I have seen on this subject. It has approximately 130 pages of large print with fifty illustrations and two color plates which are very good. There are nine chapters. The first six chapters cover



history of treatment, anatomy of the veins of the lower extremities, pathology, physiology, etiology and clinical aspects. The other three chapters deal with examination of the varicose vein patient with the various tests that are simple and self-explanatory, treatment with contraindications, and injections and operative treatment; also, a comparison of the operative treatment to other surgeon's technics and the treatment of varicose ulcers which covers approximately ten pages.

I can recommend this book highly as being a complete work on both injections and operative treatment of varicose veins.  
C. C. W.

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NEW AND NONOFFICIAL REMEDIES, 1939, containing descriptions of the articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association on Jan. 1, 1939. Pp. 617 + LXVII. Chicago: American Medical Association. 1939. Price \$1.50.

Each year a revised list of the articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association as of January 1 is published in book form under the title of "New and Nonofficial Remedies." The book contains the descriptions of acceptable proprietary substances and their preparations, proprietary mixtures if they have originality or other important qualities, important nonproprietary nonofficial articles, simple pharmaceutical preparations, and other articles which require retention in the book.

A list of articles and brands accepted by the Council, but not described, is included in the book to cover simple preparations or mixtures of official articles (U. S. P. or N. F.) marketed under descriptive, nonproprietary names for which only established claims are made. Diagnostic reagents which are not used in or on the human body, and protein diagnostic preparations are not included in "New and Nonofficial Remedies" unless the determination of the status of these products by the Council has been requested by the distributor. If such products are found to be marketed in accordance with the Council's rules, they may be included in the list of undescribed but acceptable articles.

A supplement to the annual volume of "New and Nonofficial Remedies" is published twice a year to bring up to date such current revisions and additions as have been necessary since its last publication. Every product included in the book is subject to the official rules of the Council. The comments to rules are changed occasionally by way of clarifying interpretation to insure fair consideration of all submitted preparations as new standards are recognized. Such constant and critical consideration of its contents provides the physician with a valuable reference list of acceptable new preparations on which to base his selection for use in treatment according to the established current practices of the profession.

"New and Nonofficial Remedies" for 1939 omits many articles which appeared in the publication for 1938. A few of these have been omitted by action of the Council because they conflict with the rules that govern the recognition of articles or because their distributors did not present convincing evidence to demonstrate their continued eligibility. Among these are: Biliposol, Sero-bacterins and Suppositories Salyrgan. A considerable number of others have been omitted as being off the market.

The 1939 "New and Nonofficial Remedies," of course, contains the revisions which appeared in the supplements for the 1938 edition, and continues the plan of grouping together articles having similar composition or action under a general discussion. These discussions have undergone considerable revision in the 1939 edition. Further revision of statements regarding the ac-

tions, uses, dosage, composition, purity, identity, strength or physical properties of many of the articles has also been necessary in some cases. Noteworthy revisions are: Anesthetics, Local; Bismuth Compounds, Organs of Animals; Vitamins and Vitamin Preparations and Liver and Stomach Preparations.

The indices of the new volume of "New and Nonofficial Remedies" are of the same order and plan as in previous editions. A general index lists accepted articles, including those not described. This is followed by an index of distributors in which appear all the Council accepted articles listed under their respective manufacturers. Finally, a bibliographical index is added for listing proprietary and unofficial articles not included in N. N. R. This includes references to the Council publications concerning each such article as has appeared in *The Journal of the American Medical Association*, "Reports of the Council on Pharmacy and Chemistry," "Propaganda for Reform," Vols. 1 and 2, or "Reports of the American Medical Association Chemical Laboratory."

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PATHOGENIC MICROORGANISMS. A Practical Manual for Students, Physicians and Health Officers. By William Hallock Park, M.D., Late Professor of Bacteriology and Hygiene, New York University College of Medicine, and Director Emeritus of the Bureau of Laboratories of the Department of Health, New York City, and Anna Wessels Williams, M.D., Former Assistant Director of the Bureau of Laboratories of the Department of Health, New York City. Illustrated. Eleventh edition, revised. Philadelphia: Lea & Febiger. 1939. Price \$8.00.

The history of the development of bacteriology has been recorded in the various editions of this work. The first edition was published in 1899. In the third edition, published in 1908, the protozoa were added. In 1914, in the fifth edition, the material was added to and rearranged to better correlate the available knowledge. Since that time the consecutive editions have shown the changes and progress in this field.

The present edition, the eleventh, brings up to date the information on etiology and diagnosis of the infectious diseases, immunity, prophylaxis and therapy. The book is presented in such a way that it is practical for the medical student, the laboratory worker and the physician.

A new chapter on bacterial variation has been added and the sections on the pathogenic yeasts and molds, the pathogenic protozoa and the filterable viruses have been completely revised.

This volume was almost the last task of Dr. William Hallock Park's useful and busy life. He died on April 6, 1939.  
S. S. B.

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HUMAN PATHOLOGY. A Textbook by Howard T. Karsner, M.D., Professor of Pathology, Western Reserve University, Cleveland, Ohio. With an introduction by Simon Flexner, M.D. Eighteen illustrations in color and 443 black and white. Fifth edition, revised. Philadelphia and London: J. B. Lippincott Company. 1938.

"A textbook is only an introduction to the essentials of a subject." Dr. Karsner's textbook on pathology gives the student that and more. The references given at the end of each chapter are for the most part in English and are sufficient for most investigations in the specialized fields. The subject matter covers the field of pathology completely and clearly.

Dr. Karsner has brought the book, now in its fifth edition, up to the most modern concepts of the subject. The limited number of illustrations are exact and well chosen. Illuminating is the newer subject matter

on pneumoconiosis, the hemopoietic system and inflammation.

Emphasis appears to have been placed on general pathology which will continue to make the book an excellent textbook for the beginner while the references given at the end of each chapter will make the book valuable for the advanced student. S. D. K.

**ANUS, RECTUM, SIGMOID, COLON. Diagnosis and Treatment.** By Garry Ellicott Bacon, B.S., M.D., F.A.C.S., F.A.P.S., Assistant Professor of Proctology, Temple University School of Medicine; Assistant Professor of Proctology, Graduate School of Medicine, University of Pennsylvania, etc. Introduction by W. Wayne Babcock, A.M., M.D., LL.D., F.A.C.S. Foreword by J. P. Lockhart-Mummery, M.A., M.B., B.C. (Cantab), F.R.C.S. (Eng.) 487 Illustrations in the text mostly original. By William Brown McNett. Philadelphia, Montreal, London: J. B. Lippincott Company. 1938.

This book with its excellent anatomical discussion as an introduction sets forth as complete an exposition of diseases in this area as has appeared. Apparently every possibility is considered and the discussion is well rounded without being voluminous.

The chapter on "Pruritus Ani" is particularly timely and up to date and the treatment is practical, specific and detailed. There is also an excellent chapter on "Malignancy" and the pathology and treatment of it are completely covered. The book is well illustrated with photographs and diagrams, and both amplify the text.

In the foreword by J. P. Lockhart-Mummery, he recommends the book to all proctologists. General and gastro-intestinal surgeons will find it equally useful.

H. A. H.

**OTOLARYNGOLOGY IN GENERAL PRACTICE.** By Lyman G. Richards, M.D., Fellow in Otolaryngology, Courses for Graduates, and Assistant in Surgery, Harvard Medical School, etc., with a foreword by D. Harold Walker, M.D., Professor Emeritus of Otolaryngology at Harvard Medical School. Illustrated. New York: The Macmillan Company. 1939. Price \$6.00.

This book was written for the general practitioner. The simple direct and interesting style makes this presentation quite comprehensive. The subjective matter is presented in thorough detail but not to the extent of fatiguing the reader; hence it is valuable also as a reference book.

The symptomatology, diagnosis, pathology, treatment and contraindications are clearly set out. The methods of treatments are modern and up to date.

Being a book for the general practitioner the author points out the advisability of trained consultants when the aspect of the case changes from a simple one to that of a more complex phase.

Diagrams and illustrations add clarity to the graphic presentation.

This book has a definite appeal and would be a real value to the practitioner in his treatment of ear, nose and throat cases.

R. J. P.

**MICROBIOLOGY AND PATHOLOGY.** By Charles F. Carter, B.S., M.D., Director, Carter's Clinical Laboratory, Dallas, Texas; Consulting Pathologist, St. Louis Southwestern Railway Hospital, Texarkana, Arkansas, etc. With 165 text illustrations and twenty-five color plates. Second edition. St. Louis: The C. V. Mosby Company. 1939. Price \$3.25.

This represents the second edition of a work intended primarily as a textbook for nurses. The book is easy to read and the paper on which it is printed is the new

green paper which helps considerably when reading is done under artificial light. The text seems, to the reviewer, to reflect the present trends in the training of nurses; namely, to give them a little information about a great many things. The book does this since it covers briefly most of the important aspects of bacteriology and pathology. There are several excellent chapters which should be valuable to the nurse, the chapter on disinfection and sterilization and on water and milk are examples. The colored reproductions, taken for the most part from other works, add much to the value of the book.

Several types of questions for review are given at the end of each chapter and these should, if answered, help to clarify the subject matter.

The book is probably adequate for a text if the contents are amplified by lectures and laboratory exercise.

R. O. M.

**AN INTRODUCTION TO SOCIOLOGY AND SOCIAL PROBLEMS. A Textbook for Nurses.** By Deborah MacLurg Jensen, R.N., B.Sc., Social Service Consultant to the Visiting Nurses Association, St. Louis; Lecturer in Nursing Education, Washington University, etc. St. Louis: The C. V. Mosby Company. 1939. Price \$2.75.

The author of this book, who has had considerable experience in nursing, social work and teaching, says in the preface that the book is intended as a text for two major subjects, and that the selection of material has been made with the "nursing school situation constantly in mind." But many physicians inclined to be honest with themselves must approach the subjects of sociology and social problems with no more complacency than should become a nurse in one of Mrs. Jensen's classes. Thus the book is far from out of place in the library of any medical man or medical society.

In the section on sociology, Mrs. Jensen considers man's social nature and the development of personality; social groups and their leaders; communities and their component organizations; historic and contemporary aspects of the family, its disorganization and reorganization; the nurse and her relation to both community and family.

Under social problems, there is an excellent chapter, "Introduction to the Social Aspects of Illness," followed by three chapters on the individual's reaction to illness, the last of these chapters being on medical social work in its relation to nursing. Under "Social Problems in the Modern Community," the writer discusses those who are economically, physically, mentally or socially handicapped.

At the end of each of the seven divisions of the book, the hurried, harried teacher will be glad to find a carefully worked out list of questions and exercises covering the subject-matter, as well as a list of references for further study.

The four chapters devoted to the family are particularly well handled, except that the controversial but vitally important subject of contraception is studiously avoided. In her discussion of "race as a social group," Mrs. Jensen gives her readers and students an enlightened point of view which is most welcome to anyone who can appreciate the baneful effects of race-prejudice upon the morale and general well-being of those cursed by it.

To many physicians, sociologists and social workers are meddlesome outsiders who would be harbingers of socialized medicine. Even if such an attitude were in general correct, it must be said in this instance that Mrs. Jensen minds her own business very capably—and there is no evidence that that is because her husband is himself a physician.

The general format of the book, the type and the faintly green dull-finished paper are decidedly helpful to the reader.

P. J. W.



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### PRESENT STATUS OF THERAPY WITH SULFANILAMIDE AND SULFAPYRIDINE

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ANNE M. PERLEY, M.A.

AND

MARY B. RUHOFF, A.B.

ST. LOUIS

The remarkable results of sulfapyridine therapy in pneumococcus infections which were first obtained and reported by Whitby,<sup>1</sup> Evans and Gaisford<sup>2</sup> and other British investigators<sup>3</sup> seem to have been duplicated quite regularly by most subsequent workers in the field of bacterial chemotherapy.<sup>4,5</sup> The undoubted superiority of sulfapyridine over sulfanilamide in the control of pneumococcus infections immediately raises the question of whether or not a similar superiority exists with other infections or whether the combined use of both sulfapyridine and sulfanilamide offers better results in certain infections. In order to help answer these questions we are reviewing our clinical experiences to date with the two drugs, and also are presenting some additional data concerning oral, rectal and intravenous administration of sulfapyridine and its sodium salt.

#### STREPTOCOCCUS INFECTIONS

Experiences with sulfanilamide in the control of infections with streptococcus hemolyticus generally have been most gratifying, infections in tissues which naturally possess a high degree of immunity or resistance such as the skin, upper respiratory and urinary tracts, generally yielding more rapidly and with smaller amounts of the drug than infections in less resistant tissues such as the central nervous system, lungs, pleura and abdominal viscera. On the other hand, infections with other

types of streptococci generally have not yielded well to sulfanilamide therapy, particularly streptococcus viridans endocarditis and anaerobic streptococcus infections. Our impression at present is that sulfapyridine is as effectual as sulfanilamide in acute hemolytic streptococcus infections and much more so in streptococcus viridans endocarditis.

*Erysipelas: Sulfanilamide Treated Cases.*—Of eighteen cases, seventeen were treated successfully without other specific measures such as anti-toxin or ultraviolet or roentgen ray irradiation. Generally the skin lesion ceased to spread in from six to twelve hours after the first dose of the drug, and in from twenty-four to thirty-six hours temperature would be normal. The single death occurred in an infant of 5 weeks with extensive involvement of the face and trunk fifteen hours after start of treatment. The blood stream had been invaded in this case. The low mortality rate, 5.9 per cent, has special significance when the ages of the successfully treated cases are considered. One was but 3 weeks of age, another 1 month, one 5 weeks, one 5 months, one 6 months, two 12 months, and three more were under 2 years. In an extensive analysis, Cooke<sup>6</sup> has emphasized the high mortality rate in infants under 2 years of age, finding it to be 55.1 per cent for infants under 1 year, and 26.1 per cent for infants between 1 and 2 years. The usual method of treatment was the oral administration of 0.2 gram of sulfanilamide per kilogram of body weight (the amount necessary to raise the blood level to approximately 10 milligrams per 100 cc.) during the first two to four hours, and then one sixth the dose every four hours (to maintain the blood concentration at approximately 10 milligrams per 100 cc.) for a variable period of time. We made the mistake at first of discontinuing the drug too soon, i. e., twenty-four hours after the lesion had ceased to spread and the temperature had returned to normal, and four of the first five cases treated later developed low grade, almost "cold" abscesses at the site of the initial superficial lesion which had to be drained and which harbored viable organisms. We now feel that the original dosage (0.2 gram per kilogram per twenty-four

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Substantially as read at the 82nd Annual Meeting of the Missouri State Medical Association at Excelsior Springs, April 10-12, 1939, the North Carolina State Medical Society in May 1939, and the Jackson County Medical Society in September 1939.

hours in six divided doses) should be maintained for about forty-eight hours after the temperature has returned to normal, then cut in half for two days, and then again in half for two days before the drug is entirely discontinued.

*Sulfapyridine Treated Cases.*—As yet we have treated only two patients with sulfapyridine, one 3 months of age and one 20 months, both recovering and responding in much the same manner as the cases treated with sulfanilamide. The drug was administered orally in the dosage and manner outlined for sulfanilamide.

When sulfanilamide cannot be administered orally, it may be administered subcutaneously as a 0.5 to 1.0 per cent solution in lactate-Ringer's solution. Sulfapyridine may be administered as its sodium salt rectally or intravenously, as will be discussed.

*Respiratory Infections.*—Rhinitis, pharyngitis, tonsillitis, sinusitis and otitis media, when due to the hemolytic streptococcus, run such variable courses as to make drug evaluation difficult. We are convinced, however, from the treatment of several hundred cases that with both sulfanilamide and sulfapyridine in the dosage outlined for erysipelas, rapid control of such infections should be expected and that prevention or abortion of mastoiditis will be the rule. It is also apparent that smaller doses of either drug also frequently may be efficacious. Our preference, however, is decidedly for the full dosage administered as early as possible and until the infection is clearly under control, and then gradually diminishing dosage until the infection is entirely eradicated.

Our experiences with hemolytic streptococcus bronchitis, pneumonia and empyema, while quite limited as to number of cases, point to favorable effects of both sulfanilamide and sulfapyridine, the latter being the drug of first choice in such cases because of the chance of mixed infections including the pneumococcus and staphylococcus.

*Scarlet Fever.*—Our experiences with scarlet fever indicate the combined use of sulfanilamide and scarlet fever antitoxin or convalescent serum. Past experiences with serum alone have convinced us that, while rapid fall in temperature, fading of the rash and general lessening of "toxic" manifestations are to be expected, streptococcus invasion with secondary septic complications such as sinusitis, otitis media and mastoiditis cannot be greatly affected. On the other hand, sulfanilamide alone does not lead to the rapid disappearance of toxic manifestations. The treatment of choice seems to be the prompt administration of sulfanilamide in the usual manner in all cases of scarlet fever, and the early administration of serum to those cases showing severe toxic manifestations (high fever, extreme rash and severe prostration). Although only rarely have we noted suppurative complications in cases treated in such a manner, it is interesting to note that nonsuppurating cervical adenitis with fever has not been uncommon. Such ade-

nititis possibly has an allergic basis and is comparable to transient nonsuppurative scarlatinal arthritis and nephritis. The occasional suppuration of such glands, however, points to bacterial invasion and longer viability of organisms in gland tissue than in the mucous membranes.

*Lateral Sinus Phlebitis and Thrombosis.*—Although such cases may run variable courses, they seem more susceptible of analysis of drug effect because usually septicemia with chills, remittant fever, leukocytosis and other such septic manifestations will persist and eventually lead to metastatic foci of infection in the lungs or joints or to meningitis unless prompt and effective surgical handling of the diseased mastoid and vein are instituted.<sup>7</sup> The prompt preoperative lessening of such symptoms with sterilization of the blood stream following either sulfanilamide or sulfapyridine in the usual dosage, with subsequent operation under more favorable circumstances, occurred in eight of ten cases\* treated with sulfanilamide and sulfapyridine, as illustrated in figure 1. The two exceptions terminated fatally and are deserving of special comment. One was an infant 25 months of age with a mixed infection including an anaerobic streptococcus, an unidentified gas-producing gram negative bacillus and a non-mannite fermenting staphylococcus. No ameliorating effect whatever was noted from sulfanilamide therapy, whole blood transfusions, fluid administration and operative procedures, and before death extensive metastatic infection with gas formation had occurred. The other case, a boy of 7, developed otitis media and mastoiditis with cellulitis of the adjacent scalp and face shortly after measles. He failed to respond to sulfanilamide therapy and to drainage of the area of cellulitis after localization had occurred and soon presented the picture of involvement of

\*This statement should not be misinterpreted; we do not advocate a trial period of drug treatment to the exclusion of surgery. In suspected cases of lateral sinus phlebitis, adequate sulfanilamide administration is indicated along with other measures designed to prepare the patient for operation, and can usually be accomplished during the time required for the procedures necessary for the establishment of the diagnosis (as careful otologic history, complete physical examination, roentgen ray of mastoids, blood cultures and examination of spinal fluid by the Queckenstedt method).

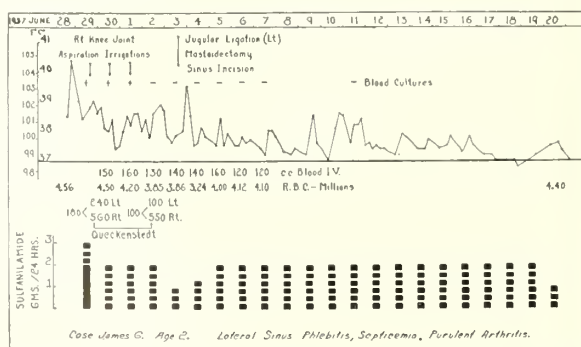


Fig. 1. Streptococcus hemolyticus lateral sinus phlebitis, septicemia and purulent arthritis treated with sulfanilamide and operation for jugular ligation, mastoidectomy and sinus incision with recovery.



the lateral sinus. At operation it was found that the thrombus in the jugular vein had already reached a point too low to place a ligature below it. Despite continued sulfanilamide therapy in dosages sometimes of 0.6 gram per kilogram per day, frequent transfusions and fluid injections, septicemia persisted. Colony counts of the blood sometimes were 2900 per cc., multiplying to twenty-four million per cc. after twenty-four hours incubation despite blood sulfanilamide concentrations of from 40 to 50 milligrams per cent. Death occurred six weeks after the onset of infection and at post-mortem it was found that the jugular vein thrombosis had extended into the left subclavian vein. In addition to a localized area of meningitis, there were also extensive metastatic infections in the viscera. This organism differed somewhat in its growth from the usual beta hemolytic streptococcus in that it was rather slowly hemolytic and grew in small mucoid colonies. It was felt, however, by Dr. J. V. Cooke to be a strain of hemolytic streptococcus.

**Meningitis.**—Five cases with the usual clinical and laboratory findings of a disseminated meningitis due to the hemolytic streptococcus were treated.

An infant of 20 months, under close observation while suffering from a cellulitis and septicemia, was treated on the first day of development of a disseminated meningitis by intramuscular prontosil, continuous spinal fluid drainage (catheter) and continuous intravenous administration, with prompt sterilization of the spinal fluid and blood stream and speedy complete recovery (fig. 2). Two children with disseminated meningitis associated with mastoiditis, one also having a brain abscess, died within five and one half and seven and one half hours after sulfanilamide therapy was started. A child of 7 years with mastoiditis and meningitis was treated very early in the course of the latter disease by sulfanilamide intrathecally and subcutaneously, sulfapyridine orally and by mastoi-

dectomy and recovered quite promptly. A child of 3 years developed disseminated meningitis two months after bilateral mastoidectomy and recovered after administration of sulfapyridine and sulfanilamide (fig. 3).

In addition to these five cases of meningitis proven by culture, there were two cases of mastoiditis due to the hemolytic streptococcus. No growth of organisms was obtained from the purulent spinal fluid. All other findings were indicative of disseminated meningitis. One recovered with prontosil therapy and spinal drainage by laminectomy, and the other without spinal drainage under combined sulfanilamide and sulfapyridine therapy.

Because of the greater diffusibility into the spinal fluid of sulfanilamide and its greater ease of administration parenterally (particularly subcutaneously and intrathecally) sulfanilamide should probably be favored over sulfapyridine in the treatment of hemolytic streptococcus meningitis, which should be treated early and vigorously with all indicated methods of treatment.

**Streptococcus Viridans Infections.**—We treated unsuccessfully with sulfanilamide and seemingly with little or no ameliorating effect four children with streptococcus viridans endocarditis. Before admitting failure in these cases, we tried the effect of larger doses than usual of the drug, 0.6 gram per kilogram per twenty-four hours for as long as a week at a time. Such doses usually but not invariably greatly increased the cyanosis and resulted in some of the highest methemoglobin concentrations observed after sulfanilamide and caused quite obvious hyperpnea with the greatest degrees of alkalosis of the carbon dioxide deficit type encountered in sulfanilamide treated cases. In the one case treated with sulfapyridine (fig. 4) marked beneficial effect could be obtained for a while which included sterilization of the blood stream, almost complete absence of fever, improved appetite and

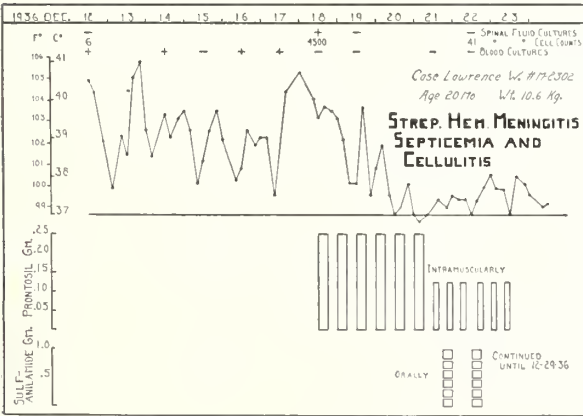


Fig. 2. Streptococcus hemolyticus meningitis, septicemia and cellulitis treated with prontosil intramuscularly and sulfanilamide orally with recovery.

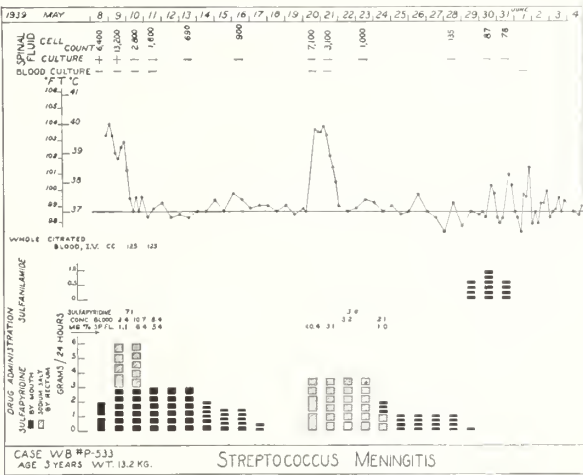


Fig. 3. Streptococcus hemolyticus meningitis treated with sulfapyridine and sulfanilamide orally and sodium sulfapyridine rectally with recovery.

weight gain. Apparently 0.2 gram of the drug per kilogram per day was required as discontinuing the drug or diminishing it to one quarter or one half the dosage led to return of fever with positive blood cultures. It is interesting to note that for some time preceding death signs of cardiac decompensation were in evidence. Whether the sulfapyridine kept the patient alive long enough to permit signs of decompensation to occur or whether the underlying rheumatic carditis was really responsible for them is uncertain.

We have observed a few cases of streptococcus viridans infection in the upper respiratory tract in the absence of endocarditis respond promptly both to sulfanilamide and sulfapyridine. Such cases, however, seem usually to do well without specific drug therapy.

*Other Strains of Streptococcus.*—In general it is our impression that other strains of streptococci, particularly anaerobic strains presumably of intestinal origin, respond poorly to either sulfanilamide or sulfapyridine. The occasional favorable response to sulfapyridine of cases of peritonitis due to *B. coli* and anaerobic streptococci suggest its continued trial until further data may establish its real value.

#### MENINGOCOCCUS INFECTIONS

Our personal experience in the treatment of meningococcus infections with sulfanilamide or sulfapyridine has been limited to twelve cases. Two were of the so-called fulminating variety with septicemia and purpura. One, an infant of 2½ years, whose spinal fluid had not been invaded, died in less than twenty-four hours after the onset of the illness and shortly after the first subcutaneous dose of sulfanilamide; the other was a child of 6 years with a similar picture but also having meningitis. This latter patient lived long enough to receive antitoxin as well as a first dose of sulfanilamide. Eight of the remaining ten cases recovered in such a way as to leave little doubt of the value of the

drug therapy. One extremely toxic patient recovered with sulfapyridine treatment alone. An infant aged 1 month recovered with a combination of the drugs. The remainder were treated with sulfanilamide only, or in combination with antitoxin. One of the two deaths occurred in an infant of 6 months during lumbar puncture one week after the beginning of treatment. He had received apparently adequate amounts of sulfanilamide orally and intravenously and seemed to be improving in that after forty-eight hours of treatment the spinal fluid was sterile and remained sterile with diminishing cell count. Fever and stupor, however, persisted up to the time of sudden death from respiratory failure during lumbar puncture. The other death occurred in an infant also of 6 months. This patient, a case of apparently arrested hydrocephalus, was admitted with a purpuric rash and high fever. Blood cultures were sterile and spinal fluid was normal. After five days, however, meningeal signs developed and the spinal fluid became purulent due to meningococcus invasion. Sulfapyridine therapy was then instituted and the spinal fluid became sterile and the temperature returned to almost normal. Death occurred quite unexpectedly in this case and no autopsy was permitted.

While the majority of the cases recovering showed almost immediate improvement in all respects after institution of drug therapy, several showed first an increase in spinal fluid cell count coincident with diminution in the number of organisms and fall in temperature and otherwise clinical improvement. We are inclined to regard this as an expression of protection of the leukocytes by sulfanilamide from overwhelming infection, as did Osgood in his bone marrow culture experiments.<sup>8</sup> The course of such a case is shown in figure 5.

Our present feeling about meningococcus infections is that sulfanilamide therapy with the usual dosage orally, or subcutaneously if necessary, and intrathecal administration for the first day or two is the method of choice. In unusually toxic cases

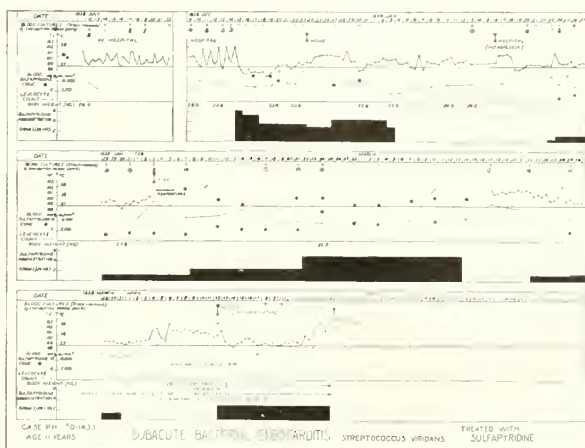


Fig. 4. Subacute bacterial endocarditis due to streptococcus viridans treated with sulfapyridine.

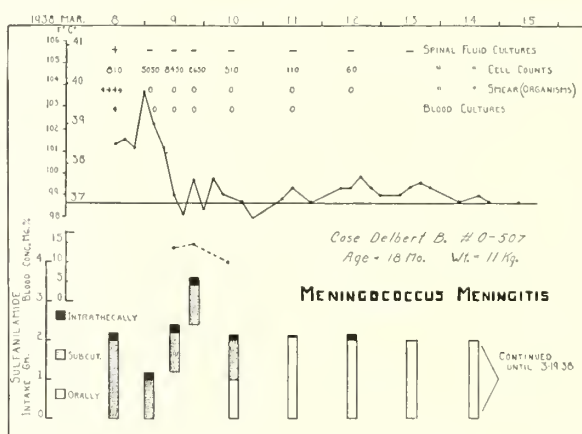


Fig. 5. Meningococcus meningitis treated with sulfanilamide orally, subcutaneously and intrathecally with recovery.



or in cases not definitely improved in from twenty-four to thirty-six hours, serum therapy probably also should be employed. While sulfapyridine seems as effective as sulfanilamide, its less free diffusibility into the spinal fluid and the limitations imposed on its parenteral administration and the impossibility of its intrathecal administration together with its greater tendency to provoke vomiting and mental confusion, would seem to make it inferior to sulfanilamide.

#### PNEUMOCOCCUS INFECTIONS

In contrast to the difficulty in differentiating between the effectiveness of sulfanilamide and sulfapyridine in other infections, the superiority of sulfapyridine in pneumococcus infections is quite evident. Some success in the treatment of pneumonia has been reported with sulfanilamide, particularly with type III pneumonias, but it is generally felt that the drug is not effective enough to warrant its routine use.

During the last winter we have treated more than 100 infants and children with primary pneumonia of the lobar type with sulfapyridine. An analysis of the first hundred of these cases yields some interesting facts. The age incidence is shown

Table 1. *Pneumonia in Infants and Children. Age Incidence.*

Age (Years)	Number of Cases	
0-1/2	2	
1/2-1	12	
1-2	17	31
2-3	17	
3-4	10	
4-5	5	
5-6	10	
6-7	8	
7-8	4	
8-9	6	
9-10	5	
10-11	1	
11-12	0	
12-13	2	
13-14	1	
14-15	0	

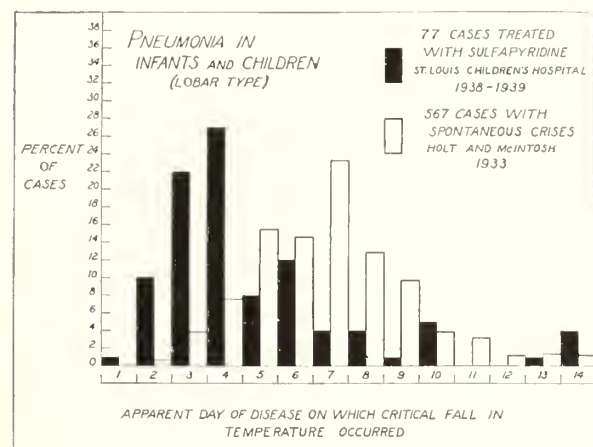


Fig. 6. Pneumonia in infants and children, apparent day of disease on which critical fall in temperature occurred in seventy-seven cases treated with sulfapyridine (shaded) and in 567 cases with spontaneous crises (unshaded).<sup>28</sup>

in table 1, and it is important to note that 31 per cent were less than 2 years of age. Fifty-eight per cent of the cases were males and 42 per cent females. The relation of the critical temperature fall to the beginning of drug treatment in terms of the number of cases having the temperature fall in the successive twelve hour periods after the institution of treatment is shown in table 2. In 78 per cent the

Table 2. *Pneumonia in Infants and Children. Relation of Critical Temperature Fall to Beginning of Treatment*

1st 12 hours	26	
2nd 12 hours	52	78
3rd 12 hours	17	
4th 12 hours	3	98
Greater than 48 hours	2	
Secondary rise in temperature	10	

temperature had become normal within twenty-four hours and in 98 per cent the fall had occurred within forty-eight hours. This becomes of even more significance when it is observed, as shown in figure 6, that 60 per cent of the cases had the critical fall in temperature during the first four days of the disease. It would appear from these two sets of statistics that in this series, regardless of the day of the disease on which the drug therapy is started, a fall of the temperature to normal can be fully expected within forty-eight hours. It has been our impression that the fall in temperature is followed by as rapid clinical improvement as we are accustomed to see in untreated cases. A secondary rise in temperature did occur in 10 per cent of the treated cases. This was not an immediate upswing following the initial fall but usually occurred on the second or third day following, and in most cases was only a temporary rise to temperatures slightly over 38 C. and was not accompanied by any recurrence of symptoms. We were unable to recover pneumococci from the sputum in many of the cases treated, due mostly to the known difficulty in obtaining satisfactory samples for cultures in small children and infants, but the clinical diagnosis was confirmed in every case by either fluoroscopic or roentgen ray examination. The types isolated were I, II, III, IV, VI, VII, VIII, IX, XIV, XVI and XXIX, types I, IV, and XIV being the most common. Blood cultures were taken in seventy of the one hundred cases, and of these seven had positive cultures, an incidence of 10 per cent. These were distributed between types I (three cases), VII (one case), and XIV (three cases). There were no deaths of the bacteremic patients. There were two deaths in the one hundred cases. One of these occurred less than twelve hours after treatment was begun in a patient who had an associated severe laryngotracheitis. The other occurred in a 15 months' old infant who had severe scurvy and who died during a second attack of pneumonia fifteen days later. Excluding the first of these two cases who died within twelve hours, the mortality for the treated cases is 1 per cent. The mortality of

lobar pneumonia is generally quite low in children but not nearly so low in infants, and we feel that a mortality of 1 per cent in a group containing 31 per cent below the age of 2 years must be considered significant. The average duration of treatment was five days for the infants and four days for the children. Shortening of the period of treatment of pneumonia with sulfapyridine is now being advocated by some, a policy to which we cannot wholly ascribe, particularly in the presence of a complication such as otitis media which is so common in children with pneumonia. Our experiences with the treatment of pneumonia during the last winter have led us to adopt the following plan of sulfapyridine therapy. The beginning dosage is calculated on the basis of 0.2 gram per kilogram body weight per twenty-four hours in six divided doses, the initial dose being double the divided dose. As soon as the temperature has become normal, this dosage is reduced by one half and is continued for three to four days provided the temperature remains within normal limits.

The situation in regard to empyema due to the pneumococcus is quite interesting and presents many potential opportunities for the study of the mode of action of the drug. We have treated eight cases of empyema; all were due to type I pneumococcus and all recovered. No empyema developed in patients with pneumonia after sulfapyridine therapy had been started. In the treated cases of empyema, there has been a marked effect of the drug on the accompanying systemic manifestations. In all but one case, there was an immediate fall in temperature accompanied by decreased toxicity and general improvement in the condition of the patient. Despite this, the collection of fluid in the pleural cavity seemed to continue unabated, appearing to thicken more slowly than usual and the cultures from it remained positive. This survival and growth of the organisms in a fluid which sometimes contained higher concentrations of sulfapyridine than we have ever obtained in the blood\* is most interesting, particularly when it can be assumed that the particular organism is susceptible to the action of the drug in the blood and other normal body fluids as evidenced by the general response and the clearing of the pneumonia itself. Further evidence that the drug is to some degree effective even though the infecting organism survives in high concentrations of it in the purulent pleural fluid is suggested particularly by two of the cases of empyema, one of which was complicated by an accompanying purulent pericarditis; during

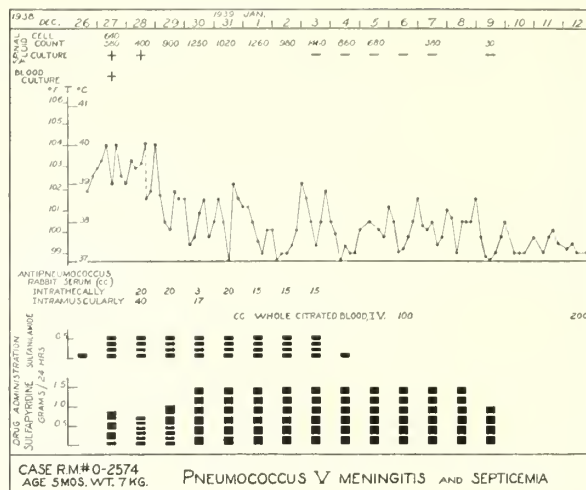


Fig. 7. *Pneumococcus V* meningitis and septicemia treated with sulfapyridine and sulfanilamide orally and antipneumococcus rabbit serum intrathecally and intramuscularly with recovery.

the later course of the disease, when the temperature again became elevated with systemic signs of infection, sulfapyridine was again quite effective in controlling it, even a third time in one of the cases. It is our feeling, therefore, that sulfapyridine should certainly be used in cases of pneumococcus empyema and that it should be continued for a prolonged time and in conjunction with effective methods of drainage.

That sulfanilamide is not entirely ineffective against the pneumococcus is also attested by the numerous recoveries from pneumococcus meningitis having been reported. In our twelve cases of pneumococcus meningitis treated with sulfanilamide we, however, had only one recovery. We have had only a single recovery\* from this disease since we have used sulfapyridine (fig. 7) but the three deaths which occurred in the other sulfapyridine treated cases happened within twenty-four hours after the drug administration was started in two of them, and the other occurred in a newly born infant receiving also type-specific (I) serum. Despite the limited experience which we have had with the treatment of pneumococcus meningitis with sulfapyridine, we hope and expect that the mortality will be materially reduced in the future although recoveries, as from streptococcus meningitis, will probably occur only in those who are seen and treated early.

Our results in pneumococcus peritonitis with sulfapyridine have been striking and in marked

\*Recently it has been brought to our attention that novocaine develops a color similar to that of sulfanilamide with dimethyl-alpha-naphthylamine which is used in Marshall's<sup>6</sup> method for the determination of sulfanilamide. We routinely use novocaine as a local anesthetic for thoracenteses, and, although we have not investigated the matter fully as yet, from the experiments we have done it appears that the unusually high values which we have sometimes obtained for the sulfanilamide concentration of chest fluid may have been due to the introduction of some of the novocaine into the collection of fluid in the pleural cavity with a resulting false value for the sulfanilamide concentration.

\*Since submitting this manuscript we have witnessed a remarkable recovery of a case of apparently fulminating type I disseminated pneumococcus meningitis, treated entirely by sodium sulfapyridine intravenously and rectally, and in another instance we witnessed prompt recovery from a disseminated meningitis from the spinal fluid of which there was no growth, the first smear of which, however, showing gram positive diplococci resembling pneumococci in morphology. This case was also treated entirely by sulfapyridine. In both instances there was associated mastoiditis and after complete recovery from the meningitis proper operative treatment of the mastoiditis was instituted.



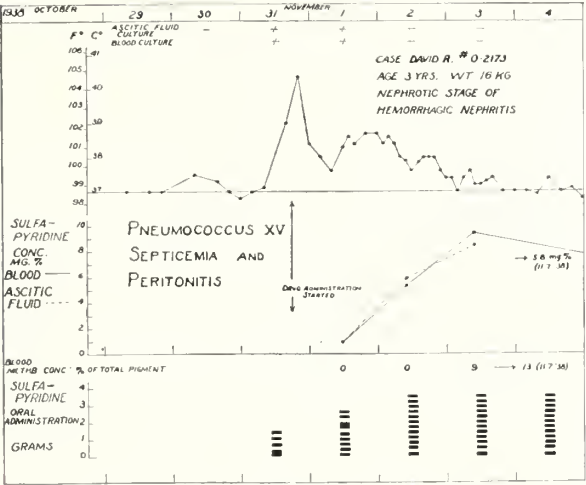


Fig. 8. Pneumococcus XV septicemia and peritonitis treated with sulfapyridine orally with recovery.

contrast to those previously obtained with sulfanilamide. Figure 8 shows the striking results obtained in such an infection in a 3 year old child who also had chronic hemorrhagic nephritis.

GONOCOCCUS INFECTIONS

We have had practically no experience in the use of the drugs in gonococcus infections but their value in such infections is universally accepted in all of the reports upon the subject. Despite the present confusion in evaluating the relative merits of the drugs in cases of urethritis, due mostly to the difficulty in establishing criteria of cure in treated cases, it is the opinion of most urologists that since the introduction of sulfanilamide in the treatment of this disease the evaluation of any other form of treatment must start with sulfanilamide as a reference point.<sup>10</sup> With this in mind, a review of the recent literature on the subject reveals that, almost without exception, all those who have compared

the efficacy of sulfapyridine in the treatment of gonococcus urethritis with that of sulfanilamide feel that the former is definitely superior.<sup>11</sup> Both drugs have been used successfully in the treatment of ophthalmia neonatorum.<sup>12,13</sup>

STAPHYLOCOCCUS INFECTIONS

Recently reports have appeared concerning the effectiveness of sulfapyridine in the control of experimental staphylococcus infections,<sup>14</sup> and there have been isolated clinical reports of its value.<sup>15,16</sup> We have treated several acute staphylococcus infections with sulfapyridine with what appeared to be quite satisfactory results. Figures 9 and 10 show the temperature curves and bacteriological data in two of these cases, the first of which is a 2 year old child who had a staphylococcus pneumonia, empyema and septicemia and the second of which is a 1 year old infant with acrodynia who developed a staphylococcus septicemia. Despite the rapid improvement of these patients having acute staphylococcus infections, the true evaluation of the effectiveness of the drug in infections due to this organism must, it seems, be based upon the treatment of the more chronic infections. At the present time, therefore, we feel that the available evidence warrants further clinical trial of use of sulfapyridine in staphylococcus infections.

COLON BACILLUS INFECTIONS

The effectiveness of chemotherapy in the treatment of infections due to this organism is most easily studied in infections of the urinary tract and here, too, the introduction of sulfanilamide has markedly altered the evaluation of previously existing forms of therapy. The effectiveness of sulfanilamide in the treatment of uncomplicated colon bacillus pyelitis is well established. There are certain details of the treatment of this disease, however, which warrant discussion. From the observations of Helmholtz<sup>17</sup> it is generally felt that sul-

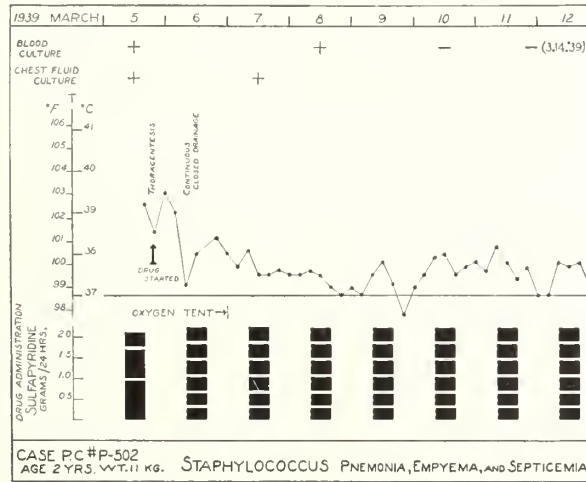


Fig. 9. Staphylococcus pneumonia, empyema and septicemia treated with sulfapyridine orally with recovery.

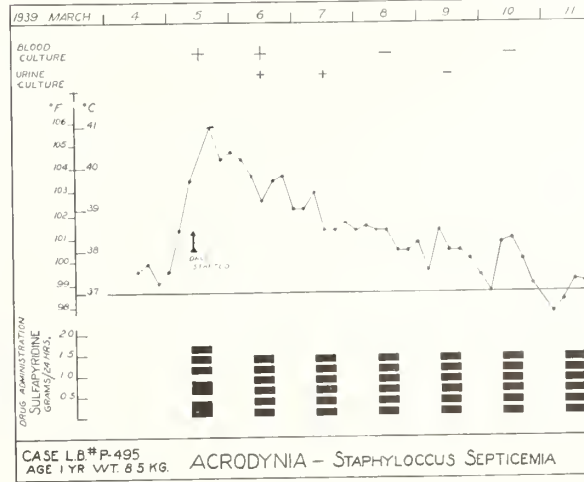


Fig. 10. Staphylococcus septicemia in a case of acrodynia treated with sulfapyridine orally with recovery.

fanilamide is a more effective bacteriostatic agent against this organism in an alkaline urine. This constitutes a real advantage of sulfanilamide over mandelic acid in the treatment of this disease because the effectiveness of the latter is partly dependent upon the production of a strongly acid and highly concentrated urine. If, as will be described later, the patient is seen in a severely dehydrated and toxic state with high fever and marked systemic reaction, it is highly undesirable to limit fluids. With sulfanilamide it is not only possible but desirable to give fluids and to allow the urine to become alkaline. We have been able to do this quite satisfactorily by using sodium lactate in the following manner. If, on admittance, the patient is dehydrated and is found to have a low plasma chloride level, as is often the case in young infants due to the excessive vomiting and loss of gastric hydrochloride acid, we give one half of our usual therapeutic dose of fortified lactate-Ringer's solution, which in this case consists of 30 cc. of one sixth molar sodium *r*-lactate plus 70 cc. of Ringer's solution per kilogram body weight, giving one third intravenously and the remainder subcutaneously or intraperitoneally. This fulfills a threefold purpose: it replaces the fluid loss; it replenishes the chloride deficiency, and it assures an alkaline urine. Furthermore, as will be discussed later, there need be no fear of the production of too dilute a urine due to diuresis which follows the replacement of the fluid loss since the concentration of the drug, even in the dilute urine, can be brought to the desired level by giving larger amounts of sulfanilamide. If, on the other hand, an alkalosis accompanies the excessive loss of acid gastric contents through vomiting and is already present on admittance, the patient is given only Ringer's solution until the fluid and chloride deficits are made up. Sulfanilamide is started simultaneously with these procedures giving the drug by mouth if possible, or subcutaneously if vomiting precludes the oral route. After the restoration of fluids and chlorides, or at the beginning of treatment in older children in whom vomiting has not occurred or the resultant changes have not progressed to this point, the alkalinity of the urine can be assured by administering mixtures of molar sodium *r*-lactate and Ringer's solution, which, when mixed in equal parts and given in doses of 1 to 2 cc. per kilogram every four hours should maintain alkalinity of the urine with safety, provided extreme degrees of renal insufficiency are not present. The substitution of sodium lactate for sodium bicarbonate has the advantage of preventing undesirable reduction of gastric acidity.<sup>18</sup> Concerning the dosage of sulfanilamide in such infections, it was shown early by Helmholz<sup>17</sup> that concentrations of 50 milligrams per cent of free sulfanilamide in the urine was effective against colon bacillus infections. This concentration in the urine can be achieved by the administration of very small amounts of the drug which maintain blood

concentrations of only 1 to 2 milligrams per cent. Although we have found such concentrations in the urine to be quite effective in some of the uncomplicated cases of pyelitis, in which the infection can be visualized as being only a superficial one, it is our opinion that in the more severe types of urinary infections, particularly those associated with some anomaly and in which the infection penetrates more deeply into the kidney substance, successful eradication of the infection must be effected by maintaining an adequate blood as well as urine concentration of the drug. For this reason, it is our custom at the beginning of treatment of a colon bacillus pyelitis to give full doses of sulfanilamide, reaching the usual blood concentrations of 10 milligrams per cent, and then to decrease the dosage of the drug depending upon the clinical response.

Although in the few cases of colon bacillus pyelitis in which we have used sulfapyridine we have found it quite as effective as sulfanilamide, we feel that sulfanilamide is the drug of choice in the treatment of this infection because of the frequent necessity for parenteral administration of the drug, because sulfanilamide is more regularly and more completely excreted into the urine with a larger and more constant proportion in the free form and, finally, because the medication may have to be continued over an extended period.

#### ABSORPTION, EXCRETION AND DOSAGE

Sulfanilamide, as is now generally well known, is absorbed quite rapidly from the intestinal tract, diffuses readily from the blood into the tissues so that practically identical concentrations attain in all body fluid compartments and is excreted quite readily by the kidney. There seems to be some individual variation in the proportion which is acetylated. For practical purposes, since the acetylated fraction in the blood seems therapeutically inactive and usually is quite small, it can be disregarded and blood determinations of "free" sulfanilamide need only be determined as a check on adequate administration. Concerning "adequate" dosage, however, this much should be said: Fairly constant blood concentrations are probably to be sought and necessitate enteral or parenteral administration of the drug at approximately four hour intervals; the "optimum" concentration, however, is certainly not always clearly indicated and probably varies greatly with different infections and different individuals and perhaps also at different times in the course of an infection. The originally recommended Long-Bliss concentration of approximately 10 milligrams per 100 cc. is generally satisfactory, at least for most hemolytic streptococcus and meningococcus infections and for such infections these recommended dosages, as shown in table 3, may conveniently be followed. For most infants and young children this amounts to 0.2 gram per kilogram body weight per twenty-four hours in six divided doses. Before concluding that sulfanilamide is in-



Table 3.<sup>5</sup> Amounts of Sulfanilamide Necessary to Establish Effective Blood Levels (10 to 15 Milligrams Per Cent) Quickly in Patients Ill With Severe Hemolytic Streptococcal, Meningococcal, Gonococcal, Pneumococcal or Welch Bacillary Infections

Wt. of Patient		Initial Dose Per Os		Maintenance Dose Per Os q. 4 Hours (Day and Night)		Total Dose First 24 Hours	
Kilos	Pounds	Grams	Grains	Grams	Grains	Grams Per Kilo	Grains Per Pound
70	150	4.8	80	1.2	20	0.15	1.2
60	125	4.2	70	0.9	15	0.15	1.2
45	100	3.6	60	0.9	15	0.18	1.3
35	75	3.6	60	0.9	15	0.23	1.8
23	50	3.0	50	0.6	10	0.26	2.0
11	25	1.8	30	0.3	5	0.3	2.2

effectual for any given infection, one should be prepared not only to maintain blood levels four or five times higher but also to administer the drug parenterally, which may include intraspinal and intraperitoneal injections and injections into joint cavities. Some of our clinical experiences suggest increased effectiveness of the drug when it is given locally in high concentrations (cf. for instance figure 1, showing rapid sterilization of a purulent arthritis after irrigation). For subcutaneous, intraperitoneal or intravenous injection, incorporation of sulfanilamide up to 1 per cent in Ringer's or lactate-Ringer's solution (sterilized by boiling or autoclaving) seems satisfactory. For irrigation of joint cavities, extensive wounds and injection into the ventricles or subarachnoid space incorporation in "artificial spinal fluid"<sup>19</sup> seems theoretically better. If sterile dry crystalline material is available, it can simply be added to the artificial spinal fluid when the latter is ready for use. If unsterile, it can be added in proper amount to solution no. 1, which can then be resterilized by heat before mixing with solution no. 2. When unusually high concentrations of sulfanilamide are maintained greater attention must be paid to toxic manifestations, particularly such as cyanosis due to methemoglobin, alkalosis, anemia and leukopenia.

The situation in regard to sulfapyridine is somewhat different due to its slight solubility which is

of approximately 30 milligrams in 100 cc. of water at 27 C. In general, sulfapyridine, when given by mouth, is absorbed more irregularly than is sulfanilamide, and due to its low solubility oral administration is the only practicable method by which the drug as such can be given. As can be seen from figure 11 the final blood level of the drug at which equilibrium is established varies considerably in different individuals receiving approximately equivalent dosages. Despite this, it is our feeling that in the ordinary infections for which sulfapyridine is used, effective blood levels will in most cases be obtained and maintained if adequate dosages of the drug are given which, in the case of infants and children, appear to be approximately 0.2 gram per kilogram per twenty-four hours. This dosage may produce a blood concentration ranging from 3 to even 15 milligrams per cent, usually, however, between 5 and 10 milligrams per cent; but until more is known of the optimal blood concentrations in the various infections a more closely controlled level does not seem necessary. There is little if any danger of overdosage if there is adequate fluid intake and output. If, on the other hand, a type of infection which is known to respond to sulfapyridine fails to do so using this dosage, it is necessary to determine the concentration of the drug in the blood in order to evaluate adequacy of dosage.

The percentage of the ingested sulfapyridine appearing in the urine is less than that of sulfanilamide and the percentage varies more widely. Sulfapyridine likewise exists in the blood in both the unaltered and conjugated form, and apparently a larger and more irregular amount of sulfapyridine in the blood is present in the conjugated form than of the sulfanilamide. Although sulfapyridine appears to diffuse rapidly throughout the various body fluids, it appears in the spinal fluid in only one half to three quarters of the concentration in the blood, as has been observed by many investigators, and apparently is not merely on the basis of the spinal fluid concentration lagging behind that of the blood. The elimination of sulfapyridine following a single oral dose is somewhat more prolonged than that of sulfanilamide.

Because vomiting is such a frequent toxic effect of sulfapyridine and because it may be present in many of the infections for which sulfapyridine is

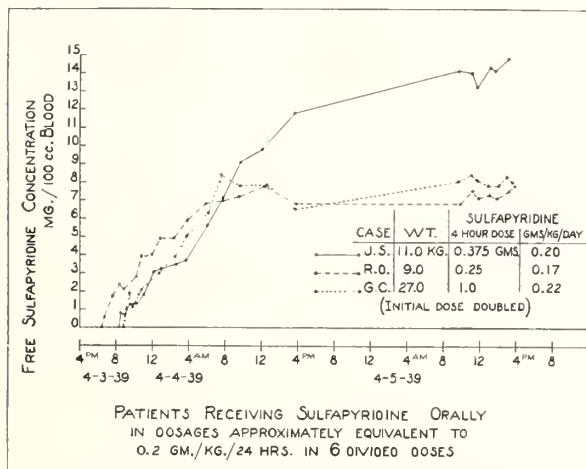


Fig. 11. Blood concentrations of free sulfapyridine in patients receiving sulfapyridine orally in dosages approximately equivalent to 0.2 gram per kilogram per twenty-four hours in six divided doses.

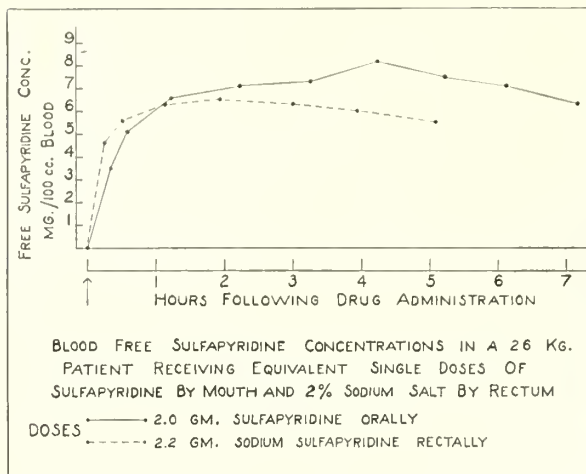


Fig. 12. Blood free sulfapyridine concentrations in a 26 kilogram patient receiving equivalent single doses of sulfapyridine by mouth and 2 per cent sodium sulfapyridine by rectum.

indicated, a form of sulfapyridine which can be given parenterally is of considerable usefulness. This is provided in the form of the sodium salt of the drug, the preparation of which was described by Marshall and his coworkers.<sup>20</sup> This compound dissolves in water to the extent of 63 grams in 100 cc. at 25 C. It cannot, however, be given subcutaneously because the pH of a 1 per cent solution is 10.4 and this high alkalinity would cause marked tissue reaction. We have previously reported<sup>21</sup> upon our earlier experiences with the use of this sodium salt by rectum which appears to be quite satisfactory. Figures 12, 13 and 14 compare the rates of absorption of sulfapyridine orally with sodium sulfapyridine rectally in terms of the blood concentrations and it can be seen that the latter is of comparable promptness and completeness. For the rectal administration of the sodium salt we have employed a 2 per cent solution giving 4 cc. per kilogram body weight as a retention enema for the

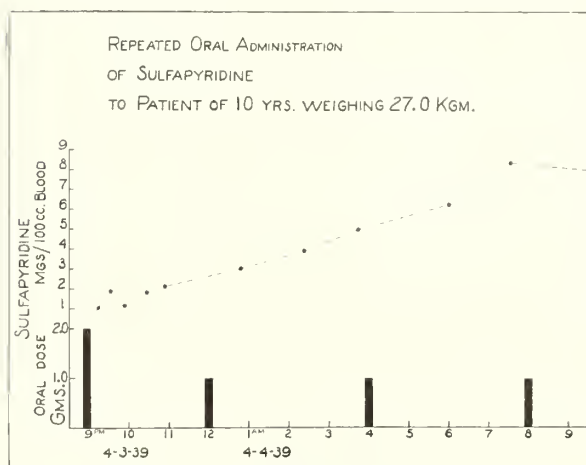


Fig. 13. Blood concentrations of free sulfapyridine following repeated oral administration of sulfapyridine to patient of 10 years weighing 27 kilograms.

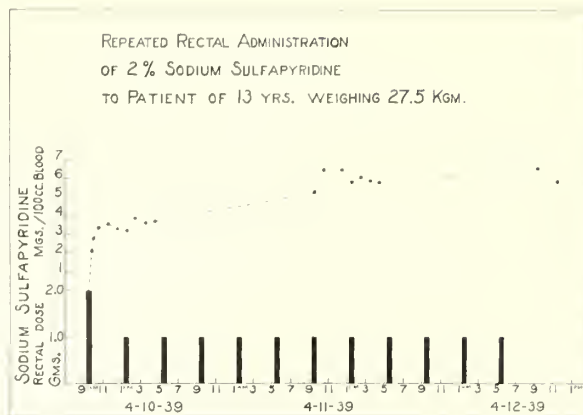


Fig. 14. Blood concentrations of free sulfapyridine following repeated rectal administration of 2 per cent sodium sulfapyridine to patient aged 13 years weighing 27.5 kilograms in doses approximately equivalent to those of sulfapyridine in figure 13.

initial dose followed by repeated administration of 2 cc. per kilogram body weight every four hours. Signs of rectal irritation, as manifested by diarrhea, were believed to occur in two infants, but in most cases no symptoms of this are manifest. Marshall and Long<sup>22</sup> have reported upon the use of sodium sulfapyridine intravenously and we have employed this method using a 5 per cent solution of the compound in dosages of 1 cc. per kilogram body weight. Figures 15 and 16 show the blood concentrations following single and repeated intravenous injections of the sodium salt. The rapid diffusion of the drug from the blood stream into the other body fluids, as shown by the quick fall of the high concentrations observed immediately after the injection, would seem to indicate that fairly uniform concentrations may be obtained by this route. The prolonged period during which the concentration remains fairly constant after the initial rise following a single intravenous injection is interesting and not entirely explainable. Because of this, however,

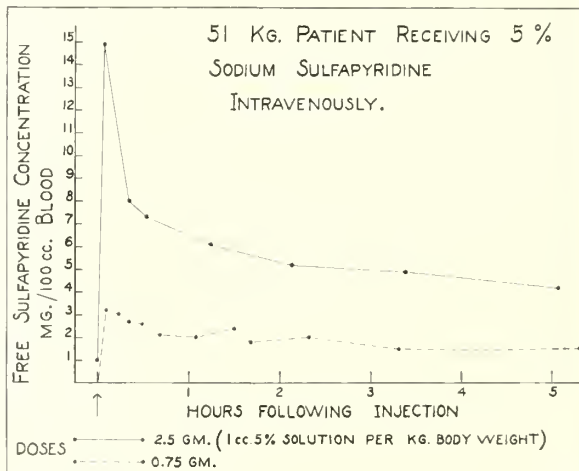


Fig. 15. Blood concentrations of free sulfapyridine in a 51 kilogram patient receiving 5 per cent sodium sulfapyridine intravenously.





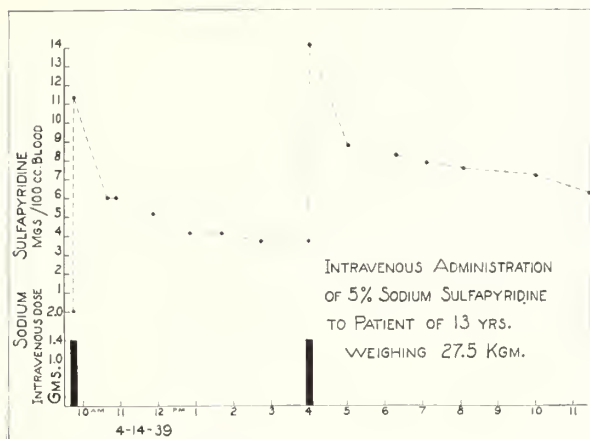


Fig. 16. Blood concentrations of free sulfapyridine following the intravenous administration of 5 per cent sodium sulfapyridine to patient of 13 years weighing 27.5 kilograms.

it may be possible to maintain adequate blood concentrations with the repeated injections spaced at intervals of as long as twelve hours. The foremost indication for this method of administration would appear to be in those patients in whom a high concentration of the drug is desired immediately, and after a single injection it would probably be preferable to continue the therapy either by mouth or by rectal administration since even if a routine dosage is established for the intravenous method frequent blood concentration determinations would seem to be necessary. We have not seen any local reaction due to the injection, although perivascular infiltration should be carefully avoided, nor have we seen any toxic effects from administration of the sodium salt either rectally or intravenously in addition to those caused by sulfapyridine itself. The patients receiving the drug by the intravenous route, some of whom were previously perfectly well, have experienced some gastrointestinal distress manifested by nausea, vomiting and occasionally abdominal pain, which seems to be direct evidence that these toxic effects of the drugs are at least in part due to central irritation.

#### TOXICITY

The common toxic effects of sulfanilamide are now fairly well recognized and those encountered during sulfapyridine therapy are essentially similar; but there are certain of these which should be clarified. Nausea and vomiting are more frequent following sulfapyridine administration, particularly during the first day or two of administration, and although vomiting has not often interfered with continuation of the medication in our series of infants and children, who appear to be less susceptible to these effects than adults, certain measures may have to be adopted to increase the tolerance for the drug in this respect. Pepper and his associates<sup>4</sup> advocate the following: (1) mixing the drug with water, fruit juices or milk; (2) administration of small amounts of sodium bicarbonate

or aluminin hydroxide solution after ingestion of the drug; (3) temporary omission of treatment for one or two doses; (4) the use of barbiturates and chloral hydrate; (5) the introduction of sodium chloride and dextrose intravenously; (6) the use of nicotinic acid in daily doses of from 300 to 450 milligrams. We have mentioned previously that in the presence of vomiting from any cause the drug can be administered in the form of the soluble sodium salt either rectally or intravenously. Mental confusion, similar to that occurring during sulfanilamide administration, sometimes accompanies sulfapyridine therapy. We have not been impressed with any marked disturbance in the red blood cells by either of these drugs, which may be due to our belief that whole blood transfusions should be given in most severe infections and any tendency of the drugs to produce anemia may therefore have been masked. There are, however, two types of disturbances commonly described. The first of these is a mild type of hemolytic anemia which develops particularly after prolonged use of the drugs which can be controlled easily by transfusions and which is not a contraindication to further treatment. The second type is an acute hemolytic anemia which usually begins soon after treatment is started, which has all of the characteristics of a severe, acute, hemolytic anemia, from which some deaths have been reported, and which is a definite indication to stop drug treatment. Serious disturbances in the white blood cells have been reported with the use of both of these drugs and this constitutes the most serious of the toxic reactions. Dolgopol and Hobart<sup>23</sup> recently reviewed the cases of granulocytopenia in sulfapyridine therapy and added cases of their own. They point out that all cases of granulocytopenia associated with sulfapyridine therapy which have been reported received large amounts of the drug during the course of treatment and that in two of the cases the manifestations of granulocytopenia did not appear until after the drug had been discontinued, which emphasizes the importance of doing white blood cell counts on patients following a course of sulfapyridine therapy as well as during the course of the drug administration, particularly in those patients who have received large amounts of the drug. Drug fever occurs with both drugs and, because it is often the initial or warning sign heralding one of the more dangerous reactions, when it occurs the drug should be stopped if possible or further therapy must be undertaken with greater caution. Rashes occur with both drugs and the drugs should be stopped unless the maintenance of the drug is of greatest importance. Hepatitis has been reported to occur during the course of sulfanilamide therapy.

The occurrence of urinary concretions, composed mostly of acetylsulfapyridine, has been described in experimental animals,<sup>24</sup> and several cases of hematuria occurring in patients during the course of sulfapyridine therapy have been reported, which





Table 4. Effects of Large Doses of Sulfanilamide on Acid Base Equilibrium and Methemoglobin Production

Case	Age (yrs.)	Sulfanilamide		Hemoglobin Gm./100 cc.	Methemoglobin % Total Pig.	Serum CO <sub>2</sub> Cont. Vols. %	Serum pH	Remarks
		Gm. per Kg. per 24 hrs.	Mg. per 100 cc. blood					
J. L.	14	0.6	38.8 48.2	10.5	17			Strep. viridans endocarditis Mastoiditis Influenzal meningitis
M. R.	10		13.2	13.3	33			
I. P.	3½			8.9	31	36.0	7.47	
B. G.	9	0.6	41.6 52.6 44.9	11.5	29	40.5	7.52 7.55	Strep. viridans endocarditis
M. H.			17.9	13.5	23	36.3 62.0 62.0 64.5	7.47 7.57 7.55 7.50	
			20.0 25.6 27.8	13.0	23	51.9	7.45	Cellulitis of the face

alkali, in the form of sodium bicarbonate, be given routinely to all patients receiving the drug. This practice has received widespread acceptance. In a more thorough study of the subject, however, we<sup>27</sup> have shown that contrary to the interpretation of the fall in carbon dioxide content of the blood representing a state of acidosis, that actually it represents a carbon dioxide deficit type of alkalosis, and, as is shown in figure 17, is brought about as follows: As a part of the effect of large doses of sulfanilamide on the central nervous system there is hyperventilation which sometimes is quite obvious, and sometimes merely an increase in depth of respiration which is not so apparent. The events following this are those classic of the experiment of voluntary hyperventilation. There is a blowing off of carbon dioxide with a resulting increase in the ratio of bicarbonate to carbonic acid and an increase in the blood pH. The response of the kidneys to this increased pH of the serum is an increased excretion of bicarbonate which accounts for, as shown in the table, the abrupt rise in urinary pH. This, then, along with the blowing off of carbon dioxide accounts for the fall in the carbon dioxide content of the serum, which could not be on the basis of an acidosis because of the alkaline urine and the increased pH of the serum. We feel,

therefore, that alkali should not be given routinely with sulfanilamide, and that in some cases, particularly if an alkalosis exists from some other cause, it may be definitely harmful. We have not observed hyperventilation in association with sulfapyridine therapy, and figure 18 shows that in an experiment the chemical changes in the blood and urine which were noted following a large dose of sulfanilamide did not occur following the administration of a comparable dose of sulfapyridine. That both the methemoglobin accumulation and the change in the acid base balance in the direction in which we indicate can proceed to quite unusual values is shown in table 4, which shows values obtained in patients given large doses of sulfanilamide and in whom the blood concentrations of sulfanilamide reached values over 50 milligrams per cent.

#### SUMMARY AND CONCLUSIONS

We have reviewed our experiences with the use of sulfanilamide and sulfapyridine in the various types of bacterial infections particularly with the purpose of comparing the effectiveness of these two drugs against the various organisms. From our experiences thus far, it would appear that sulfapyridine is of undoubted superiority primarily in infections due to the pneumococcus and also in those due to the staphylococcus, streptococcus viridans and the gonococcus. It appears, also, to be of equal effectiveness in infections due to the beta hemolytic streptococcus, the meningococcus and the colon bacillus. In certain infections due to the last group of organisms, however, there are certain details in the treatment which make sulfanilamide preferable at the present time. The absorption and excretion of the two drugs have been discussed including the use of the soluble sodium salt of sulfapyridine with the use of which adequate levels of sulfapyridine in the blood can be obtained and maintained by rectal and intravenous administration. The toxic effects of the two drugs have been described with particular emphasis upon the accumulation of methemoglobin as the cause for the cyanosis accompanying the administration of the drugs and upon the change in the acid base balance in the direction of an alkalosis.

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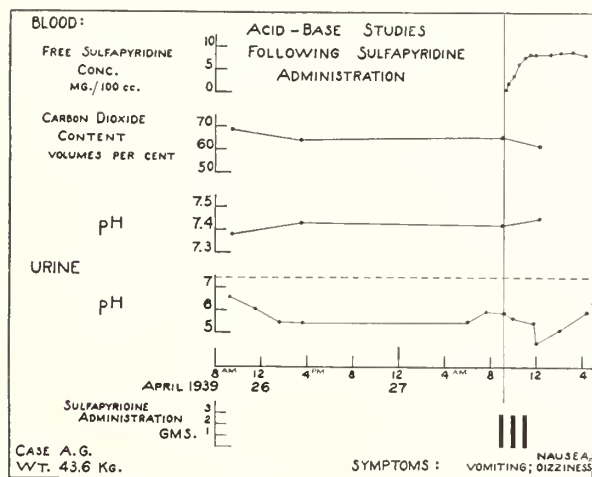


Fig. 18. Acid base studies following sulfapyridine administration.

## BIBLIOGRAPHY

1. Whitby, L. E. H.: Chemotherapy of Pneumococcal and Other Infections with 2-(p-aminobenzenesulfonamido) Pyridine, *Lancet* **1**:1210 (May 28) 1938.
2. Evans, G. M., and Gaisford, W. F.: Treatment of Pneumonia with 2-(p-aminobenzenesulfonamido) Pyridine, *Lancet* **2**:14 (July 2) 1938.
3. Agranat, A. L.; Dreosti, A. O., and Ordman, D.: Treatment of Pneumonia with 2-(p-aminobenzenesulfonamido) Pyridine (M & B 693), *Lancet* **1**:309 (Feb. 11) 1939.
4. Pepper, D. S.; Flippin, H. F.; Schwartz, L., and Lockwood, J. S.: The Results of Sulfapyridine Therapy in 400 Cases of Typed Pneumococcal Pneumonia, *Am. J. M. Sc.* **198**:22 (July) 1939.
5. Long, P. H., and Bliss, E. A.: The Clinical and Experimental Use of Sulfanilamide, Sulfapyridine, and Allied Compounds, New York, The Macmillan Company, 1939. (For table 3, see page 152.)
6. Cooke, J. V.: Erysipelas and Allied Dermatitis, in Brennemann's Practice of Pediatrics, Hagerstown, Md., W. F. Prior Co., Inc., 1938, vol. 2, chap. 6.
7. Hartmann, A. F., and Cone, A. J.: Phlebitis of the Lateral (Sigmoid) Sinus in Infants and Children, *South. M. J.* **30**:487 (May) 1937.
8. Osgood, E. E.: Mode of Action of Sulfanilamide, *J. A. M. A.* **110**:349 (Jan. 29) 1938.
9. Marshall, E. K., Jr.: Determination of Sulfanilamide in Blood and Urine, *Proc. Soc. Exper. Biol. & Med.* **36**:422 (April) 1937.
10. Deakin, R.: Personal communication.
11. Bowie, F. J. T.; Anderson, T. E.; Dawson, A., and Mackay, J. F.: Treatment of Gonorrhea by M & B 693, *Brit. M. J.* **1083**:711 (Apr. 8) 1939.
12. Michels, M. W.: Sulfanilamide in the Treatment of Gonorrheal Ophthalmia, *J. Pediat.* **13**:938 (December) 1938.
13. Michie, A. M., and Webster, M. H.: Gonococcal Ophthalmia Treated with 2-(p-aminobenzenesulfonamido) Pyridine, *Lancet* **2**:373 (Aug. 13) 1938.
14. Bliss, E. A., and Long, P. H.: Comparative Therapeutic Effects of Sulfapyridine in Experimental Staphylococcus Aureus Infections in Mice, *Proc. Soc. Exper. Biol. & Med.* **10**:32 (January) 1939.
15. Wade, H. J.: Staphylococcal Septicemia Treated with M & B 693, *Lancet* **1**:756 (Apr. 1) 1939.
16. O'Brien, E. J., and McCarthy, C. J.: Staphylococcus Septicemia Treated with M & B 693, *Lancet* **2**:1232 (Nov. 26) 1938.
17. Helmholz, H. F.: Urinary Infections in Infancy and Childhood, *J. A. M. A.* **111**:1719 (Nov. 5) 1938.
18. Marriott, W. McK.; Hartmann, A. F., and Senn, M. J. E.: Observations on the Nature and Treatment of Diarrhea and the Associated Systemic Disturbances, *J. Pediat.* **3**:181 (July) 1933.
19. Hartmann, A. F.: Theory and Practice of Parenteral Fluid Administration, *J. A. M. A.* **103**:1349 (Nov. 3) 1934.
20. Marshall, E. K., Jr.; Bratton, A. C., and Litchfield, J. T., Jr.: The Toxicity and Absorption of 2 Sulfanilamidopyridine and Its Soluble Sodium Salt, *Science* **88**:597 (Dec. 23) 1938.
21. Barnett, H. L.; Hartmann, A. F.; Perley, A. M., and Ruhoff, M. B.: The Treatment of Pneumococcal Infections in Infants and Children with Sulfapyridine, *J. A. M. A.* **112**:518 (Feb. 11) 1939.
22. Marshall, E. K., Jr., and Long, P. H.: Sodium Sulfapyridine, *J. A. M. A.* **112**:1671 (Apr. 29) 1939.
23. Dogopol, V. B., and Hobart, H. M.: Granulocytopenia in Sulfapyridine Therapy, *J. A. M. A.* **113**:1012 (Sept. 9) 1939.
24. Antopol, W., and Robinson, H.: Urolithiasis and Renal Pathology after Oral Administration of 2(sulfanylamino) pyridine (Sulfapyridine), *Proc. Soc. Exper. Biol. & Med.* **10**:428 (April) 1939.
25. Wendel, W. B.: Correspondence, Use of Methylene Blue in Methemoglobinemia from Sulfanilamide Poisoning, *J. A. M. A.* **109**:1216 (Oct. 9) 1937; The Control of Methemoglobinemia with Methylene Blue, *J. Clin. Investigation* **18**:179 (March) 1939.
26. Hartmann, A. F.; Perley, A. M., and Barnett, H. L.: A Study of Some of the Physiological Effects of Sulfanilamide. II. Methemoglobin Formation and Its Control, *J. Clin. Investigation* **17**:699 (November) 1938.
27. Hartmann, A. F.; Perley, A. M., and Barnett, H. L.: A Study of Some of the Physiological Effects of Sulfanilamide. I. Changes in the Acid Base Balance, *J. Clin. Investigation* **17**:465 (July) 1938.
28. Holt, L. E., Jr., and McIntosh, R.: *Holt's Diseases of Infancy and Childhood*, New York, D. Appleton Century Company, 1936, ed. 10, p. 429.

## COLOR BLIND PERSONS CAN PLAY CARDS

Color blind persons can easily play card games, *The Journal of the American Medical Association* for December 30 points out. "In all card decks," it says, "the suits are distinguished as much by the form of the pips as by the color."

## PNEUMONIA IN CHILDHOOD

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In discussing pneumonia in childhood, I shall try to present the modern interpretation of the etiology and classification with particular attention to the recent investigations pertaining to the predominant types of pneumococcal infections occurring in childhood. I will also include a resume of the pertinent points exemplified in a given case of pneumonia from a diagnostic angle with consideration of the more common diseases to be considered under the heading of differential diagnosis. A few final remarks will be directed toward the modern methods of chemotherapy and serotherapy as relating to this disease with a brief analysis of my experience with such modes of treatment.

For centuries attempts have been made to classify the pneumonias in childhood from the standpoint of symptomatology and clinical findings and from the viewpoint of the pathologist. Later attempts have been made to classify the disease by roentgen ray findings, and more recently by a study of the etiological causes. It is safe to say, however, that no one category can be of aid in classifying all cases but the physician must consider all possible angles of classification to properly diagnose the individual case. Formerly, it was sufficient for the physician to be able to say that the child did or did not have pneumonia. Then came the time when the attending physician desired to be able to distinguish between the lobar and the bronchial varieties; but now it is not enough that he be satisfied with whether or not he is dealing with lobar or bronchopneumonia, he must know the specific type of pneumococcus or other bacterial agent causing the pneumonia. Assuming that it is a lobar pneumonia and of pneumococcal origin, he must attempt to learn the specific type of infecting pneumococcus and then inaugurate one of the newer modes of therapy, namely, specific serum or one of the new azo dyes, more specifically, sulfapyridine. In simpler terms, when the physician today speaks to a fellow practitioner and tells him that he has a youngster with pneumonia, the most likely response to his statement will be this question, "Have you started sulfapyridine?"

It can be said safely that the great majority of uncomplicated cases of pneumonias occurring in children are due to the pneumococcus. It is an old idea that pneumonia occurring in the first year or two of life is nearly always bronchopneumonia; that idea is definitely erroneous and carries with it the false assumption that all pneumonias occurring early in life are accompanied by a high mortality rate. It may be said now that of uncomplicated pneumonias, lobar pneumonia, particularly in chil-

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dren over 2 years, is a relatively mild disease so far as the death rate is concerned. We must remember that lobar pneumonia may occur at any age and that bronchopneumonia may at times assume a lobar distribution.

In discussing the etiology of pneumonia, the importance of age is particularly noteworthy. It is well known that bronchopneumonia occurs secondary to some infection, particularly measles, whooping cough, the common cold and the ill defined group known as influenza. It is also known that children in the first year or two of life have little or no immunity to the causative agents of these diseases which act to lessen the infant's resistance to secondary invasion by organisms such as the hemolytic streptococci, staphylococci and the pneumococci or any combination of these, all of which may set up a virulent bronchopneumonia.

When we consider the true primary or lobar pneumonias of childhood, we must not forget that the pneumococcus is the etiologic agent in probably 80 or 90 per cent of these cases. Pneumonia may result from contact with a child who has pneumonia, from a carrier or it may be of endogenous origin. There is no doubt but that 50 per cent or more of older children may at times harbor some type of pneumococcus in their upper respiratory passages and, due to some temporary loss or lowering of resistance, the disease may become evident. However, the finding of types I, II, V, VII or VIII in the sputum is quite rare except in the presence of a true pneumococcal infection since these types are rarely normal mouth inhabitants. Today we are trying to classify the pneumonias of childhood, as far as possible, on a specific etiological basis; namely, lobar pneumonia which usually appears as an uncomplicated pneumococcal infection, and bronchopneumonia which has a wider etiological variation and clinical manifestations and is usually a mixed infection. However, it must not be forgotten that the pneumococcus may be the primary invader in cases of bronchopneumonia.

In the causation of bronchopneumonia, as previously mentioned, we must consider several rather specific types, the result of some peculiarity of the infecting organism or an unusual response on the part of the host. Streptococcal pneumonia is distinguished as being a rather severe type of bronchopneumonia associated with hemorrhage into the pleura and often empyema. It should be diagnosed or suspected if the pneumonia is secondary to a specific sore throat or scarlet fever or if the streptococcus is isolated in the blood stream or pleural cavities.

Pneumonia due to the staphylococcus is particularly critical in children from 6 to 12 months of age. This organism has a characteristic tendency of producing multiple abscesses in the lungs with associated empyema. This tendency to wide-spread infection is usually an indication of an accompanying blood stream infection with the same organisms. The diagnosis must be confirmed by either blood

cultures or pleural fluid cultures. While the very nature of this type of infection rightfully presupposes a high mortality rate, yet recoveries are reported based on the early recognition and treatment of the accompanying empyema associated, of course, with other supportive measures. There is a possibility that the new staphylococcus antitoxin of Julianelle of St. Louis may be of value in these cases. Fortunately, this is not a common type of bronchopneumonia. I recently saw one such case which, however, began as a supposed grippal infection which was rapidly followed by marked dyspnea and cyanosis with purulent sputum containing *Staphylococcus aureus* in pure culture and the typical "cotton ball" roentgen ray evidences with fatality within from forty-eight to seventy-two hours from the onset of the pneumonia. Many of you will recall that this type of pneumonia was observed in many of the Army camps associated with the influenzal epidemic in 1917-1918.

Recently Trask<sup>1</sup> has considered the Pfeiffer bacillus a common complicating organism in bronchopneumonia of childhood. Many autopsies on children dying from pneumonia revealed the association of the organism with a type III pneumococcus. Pathologically, it has been shown that the influenzal types of pneumonias in children are characterized by bronchial infections which spread downward causing obstruction of the smaller bronchioles. As a result of this necrotic obstruction some air can enter the terminal alveoli but it cannot escape and a rather characteristic type of asthmatic breathing with dyspnea and hyper-resonance to percussion is noted. I think that it is well that we call to mind here that the Pfeiffer bacillus or the influenzal bacillus is not considered today as having any etiologic relationship to the disease commonly known as influenza.

The diagnosis of capillary bronchitis is usually made by the detection of generalized fine rales with rather marked cyanosis and dyspnea in younger children. Usually there is no distinct area of localized consolidation discernible. I think it is only proper today to consider these as cases of bronchopneumonia. Certainly, the majority of these cases are more than a simple bronchitis as evidenced by their clinical course and the manifestations of illness which the children present. Two other types of pneumonia of bronchopneumonic character which one may see occasionally in infants are lipoid pneumonia due to the inhalation of oils or fats, and kerosene pneumonia due to the aspiration of common coal oil into the lungs. In this geographical area where respiratory illnesses of the nose and throat are so prevalent with widespread usage of various types of nose sprays and drops, I think it well that we pause to consider for a moment the lipoid type of pneumonia.<sup>2</sup>

Pulmonary changes due to lipoid irritation are probably more common than is suspected. The disease is characterized by a rather chronic course, often of months duration. Due to the anatomy of

the bronchial tree, the right lung is more often invaded than the left. Usually there is no fever unless some secondary infection supervenes. The usual substances which may produce this type of irritation in the lung are cod liver oil, mineral oil and milk fat. It has always been quite interesting to me why we do not see more children than we do who are victims of foreign material in the trachea, but in the normal infant the larynx apparently functions quite efficiently as a safety device for the trachea. This type of pneumonia should be suspected in marantic babies, in those who for some reason or other may have a suppressed cough reflex, in whom vomiting may have been the outstanding symptom or in cases where there has been frequent and prolonged use of oily nose drops. It is known that the animal oils are much more irritating than the majority of vegetable oils since they contain a large amount of fatty acid. Further evidences that the clinician may be dealing with this type of pneumonic process is evidenced by the roentgen ray findings which show rather characteristic patches of consolidation extending outward from the hilus, usually more marked on the right side due to the anatomical contour of the right bronchus allowing aspiration of the oil into that particular location.

The importance of the common household fuel, kerosene, as a cause of pneumonia in infancy has not received much consideration in literature on pediatrics. Undoubtedly, the condition is a much more common happening than medical literature denotes. It has long been recognized that the inhalation of the vapor of kerosene is toxic but not much attention has been accorded the possibility of aspiration of the oil into the lungs with subsequent lung damage. It has been my unfortunate privilege to see three rapidly fatal cases of bronchopneumonia, proved at autopsy, due to aspiration of coal oil into the bronchial tree following strangulation by the oil. These children die quickly, usually within from six to twelve hours, of a rapidly fatal bronchopneumonia clinically characterized by extreme dyspnea and extreme cyanosis. Waring<sup>3</sup> surveyed the literature on this subject in 1933 and noted that only seven fatal cases had been reported in children. He had nine cases of his own, only two of which recovered. Animal experimentation confirms that kerosene poisoning is serious and fatal due to a rapidly developing pneumonitis with edema of the lung. This same phenomenon was seen in many cases of war gas poisoning, particularly with phosgene. To my knowledge no regime of therapy is effective in these cases and the amount of oil which must be aspirated to produce death is also uncertain. It would seem, however, that immediate postural drainage, literally hanging the child by his heels, might lessen some of the pulmonary irritation. I mention this type of pneumonia because kerosene is such a common household article and mothers are negligent in leaving the coal oil can accessible to the toddling child.

The physician must not lose sight of the fact that the primary tuberculous infection of childhood may occur at any age in childhood, and if it does occur before the age of 2 or 3 years may be quite fulminating and often exhibits the clinical picture of a typical pneumonia. Pneumococcic infections may produce hilar shadows by roentgenogram similar to those commonly seen in the primary tuberculosis of childhood. The physician is aided in differentiating these two conditions by the fact that hilar shadows due to pneumococcic infections clear more quickly than those due to tuberculosis. The reaction to tuberculin, the history of possible home contacts or an investigation of the sputum, stools or guinea pig inoculation for positive evidences of tuberculosis should serve further to differentiate tuberculous from pneumococcic infections. In my experience the roentgen ray is valuable in giving further evidence of the probable tuberculous origin of the lung infection. Prognosis of many of these cases is bad, particularly if the age is quite low, and a high percentage of them will succumb to a generalized tuberculous infection in from six to nine months following the primary tuberculous complex. I have learned to suspect a possible tuberculous etiology in many pneumonias that present variable convalescence. The Mantoux test usually will serve to clarify this question.

Several investigators<sup>4</sup> have noted recently that some allergic children may present a pulmonary infection similar to bronchopneumonia, apparently arising as a result of a severe asthma with a superimposed infection in the lung. The evidence suggesting an allergy as a basis for this entire picture is that these cases usually have a short duration with a relatively low white blood count plus marked asthmatic symptoms and are improved by adrenalin and warm air.

The foregoing various classifications, I feel, will cover practically all of the cases of pneumonias in children which any practitioner may encounter. I feel, however, that today no diagnosis of pneumonia is complete unless the physician can state the character of the pneumonia and the type of etiologic agent producing it.

In contradistinction to the exceedingly rapid alterations and developments in the treatment of the pneumonias of childhood, the basic fundamental physical diagnostic signs and symptoms have, of course, remained the same classically. It is well that we pause to consider briefly those points which I am sure are familiar to all of you but which I have found of marked practical value in arriving at the diagnosis of pneumonia in any given case.

#### PHYSICAL DIAGNOSIS

It is not always easy for even the most experienced clinician to determine the presence of pneumonia by the observance of physical signs in the lung itself since the physical signs may be several days in developing. We must frequently and



usually, particularly in younger children, rely upon the general symptoms pointing to the presence of an acute infection plus certain signs or symptoms relative to the respiratory tract. Vomiting is often a common early symptom, convulsions are not unusual and chills may occur, particularly in older children, and in the absence of a pyelitis one must always suspect pneumonia if a chill has occurred. Probably the most valuable observation the physician can find in the child whom he suspects of having pneumonia is an increased respiratory rate associated with an expiratory grunt in connection with dilatation of the alae nasae and drawing in of the thorax on inspiration with nonparticipation of the affected side in the respiratory movements. These phenomena have been designated "habitus pneumonicus." I agree with Parmelee<sup>5</sup> in considering the expiratory grunt as practically always pathognomonic of pneumonia. Abdominal pain is particularly common in cases in which the lower lobes are involved and, with referral of the pain to the abdomen, appendicitis may be simulated readily when the right lower lobe is involved. The pulmonary findings are often quite evasive and indefinite. Diminished air entry is a valuable early sign and, occurring with the classical tubular breathing with increased whisper and egophony, make the diagnosis quite clear. Careful light percussion often will reveal early dulness if one has a keen ear for pitch. The temperature curve in the lobar varieties of pneumonia usually reaches a rather high continuous level until the time of the crisis, although there is no absolutely constant type of temperature curve. Aside from diminished air entry, crepitant vesicular rales are always present at some time during the course of the disease. Usage of the roentgenogram is in such common vogue that whenever in doubt one should resort to roentgen ray study of the lungs. Occasionally one is confronted with a child who has the clinical signs or symptoms of a pneumonia, yet the roentgen ray findings may be indefinite for several days; and the opposite is also true in that there are occasionally cases in which the roentgenogram reveals typical areas of density and yet the clinician cannot detect any definite clinical signs in the lungs even though he knows where to suspect them. The roentgenogram really serves a double purpose in establishing the presence or absence or the location of the pneumonic process as well as excluding other intrathoracic pathological conditions which might be confused with pneumonia.

Lobar pneumonia occurs usually with an abrupt onset and an abrupt end with definite evidences of consolidation of one or more lobes with absence of any signs in any other portions of the lungs; in bronchopneumonia there is usually a gradual onset with a more prolonged course and a gradual termination with the lungs showing signs on both sides. Sometimes the differentiation between lobar and bronchopneumonia is one that can be made only at autopsy. Both may occur at the same time.

In either type of pneumonia from 70 per cent to 80 per cent of the cases will give a history of preceding upper respiratory infection so we must conclude that the most frequent route of infection is by the nose and throat from whence the infection may invade the blood stream or descend into the pulmonary tree. It is true that in lobar pneumonia the onset is considered as being quite sudden because of the sudden weakness of the child and high fever, but in a majority of cases a careful history or examination of the child will elicit evidences of a cough, sore throat or head cold before the so-called sudden onset. In bronchopneumonia the fever is usually at a lower level than in lobar pneumonia and cough, weakness, prostration and marked dyspnea are rather outstanding symptoms. In the newborn, cyanosis and rapid breathing may be the only signs, there may be few or no rales evidenced and little or no fever present, particularly if the infection is overwhelming. Herpes is not, in my experience, a common manifestation in pneumonia in childhood except in the older age groups. The clinical findings, physical signs and roentgenogram are all necessary at times to establish the diagnosis of a pneumonic process, but the incident bacterial cause can be known only by bacteriologic methods. To reiterate, the complete working diagnosis of pneumonia demands knowledge of the organism producing the disease. This is obtained by sputum studies—even a single examination of a stained smear will often yield all the information needed. I feel that any child ill with pneumonia should be submitted to the following investigative procedures: (1) complete blood count, (2) blood culture, (3) roentgenogram of the chest, and (4) sputum examinations for bacteria and for typing if pneumococci predominate.

#### DIFFERENTIAL DIAGNOSIS

Probably no other disease in childhood places a greater responsibility upon the shoulders of the attending physician from the standpoint of accuracy of diagnosis than does that of the child presenting signs and symptoms suggestive of pneumonia. The parents want to know at once whether or not the child has pneumonia because this disease still strikes terror in the heart of every parent. To arrive at the answer of such a question the physician must consider many possible diseases in differential diagnosis. These confusing possibilities may be considered under three headings; namely, (1) diseases with onset similar to that of pneumonia, (2) diseases which present similar physical findings to pneumonia; (3) pneumonia presenting itself in a bizarre or atypical fashion.

Under the first heading we are familiar, of course, with the usual upper respiratory infection which may begin similarly to pneumonia. This possibility is exceedingly hard to rule out when we consider again the high percentage of cases of pneumonia which are preceded by upper respiratory infection. If, however, there is slow recovery

with the patient having more rapid respiration, continued high temperature, and the pulse-respiration-ratio disturbed, then usually a roentgen ray study of the chest will show that we are not dealing with a simple upper respiratory infection. In any severe, acute infection in a child, the onset of pneumonia must be suspected. Acute tuberculous pneumonias, as previously mentioned, may closely simulate the ordinary pneumonia. Pyelitis in female children and urinary tract infections in boys, particularly secondary to stagnation in the urinary tract due to a congenital obstruction, may be deceptive early in the diagnostic course and make one think of the possibility of pneumonia until the urinary findings disclose the diagnosis.

The intrathoracic conditions which may resemble pneumonia by giving similar physical signs follow.

1. Acute pericarditis is particularly confusing because of the shortness of breath, pain in the chest and compression of the left lung posteriorly and is easily confused with a left lower lobe pneumonia. However, the roentgenogram, cardiographic findings, pulsus paradoxus and history of preceding rheumatic or pneumonic infection will serve to differentiate this condition from pneumonia. We must not forget, however, that pneumococcal pericarditis may be a complication of pneumonia.

2. Empyema may be confusing because of the dyspnea, diminished air entry and dullness over the affected lung. The history, roentgen ray findings and aspiration of the chest easily determine its presence or absence.

3. Pulmonary infarction may resemble pneumonia closely because of the pain in the chest, sudden onset and bloody sputum. However, the sputum is usually much more frankly bloody and there are few, if any, organisms therein and the patient exhibits some cardiac condition, usually a fibrillation and endocarditis, which would serve as points of origin for the pulmonary embolus.

4. Pleurisy with effusion may at times be confusing but the same diagnostic points considered under empyema serve to differentiate this condition from pneumonia.

5. In advanced rheumatic cardiac diseases with decompensation or dilatation, there may be associated congestive failure with physical signs resembling pneumonia. Again the underlying cardiac disorder serves to differentiate the condition.

6. Congenital diaphragmatic hernia with compression and shift of the lung by the abdominal contents may also simulate pneumonia as far as physical signs are concerned, particularly the occasional presence of cyanosis and dyspnea. Careful examination, however, will usually reveal an area of tympanites over the region wherein the stomach lies within the chest cavity, associated with marked displacement of the other chest organs, and barium by mouth will disclose this abnormality.

7. Advanced miliary tuberculosis with its accompanying dyspnea and high temperature may be

suggestive of pneumonia but the roentgen ray findings serve to distinguish this disease from pneumonia.

8. Massive collapse of the lung may occur rarely with associated fever and alteration in the usual normal percussion and auscultation of the chest. Mediastinal structures are pulled to the affected side.

9. Acidosis and anhydremia in infancy with attendant hyperpnea and cyanosis may easily lead to suspicion of pneumonia unless  $\text{CO}_2$  determinations are made.

Pneumonia may present itself in a bizarre fashion wherein meningeal symptoms are paramount. Such symptoms are quite common in pneumonia, particularly in right upper lobe consolidations, and are characterized by a slight stiffness of the neck, irritability and convulsions. Occurring at the onset they are of no significance, but meningeal symptoms developing later in the course of the pneumonia almost always indicate the development of a true pneumococcal or septic meningitis. Lumbar puncture is the only safe and accurate way of handling these problems, the fluid being clear and sterile in cases of simple meningismus. Aside from pneumonia presenting itself as a possible meningitis, it also frequently manifests itself as a possible appendicitis. This of course is particularly evident in cases in which the pleuritic pain is referred to the right lower quadrant. Often the abdominal symptoms may entirely overshadow the findings in the chest. Of importance in differentiating appendicitis from right lower lobe pneumonia is that the pain in appendicitis is usually at first diffuse and then localized about McBurney's point. The abdominal pain in right lower lobe pneumonia is in reality of pleuritic origin and therefore is associated with restrained breathing and altered breath sounds over the affected area. Also the deep localized tenderness which is present over McBurney's point in appendicitis is usually not so evident when pneumonia is the cause.

#### COMPLICATIONS

A thorough knowledge of the complications, with careful observance and watchfulness for them, is of utmost importance in the care of pneumonia in infants because it is the complications of pneumonia, such as empyema, pericarditis and meningitis, to mention only a few, which account primarily for death in this disease. We know that complications are much more likely to occur in childhood than in later years and, barring such complications, the outlook for the child with pneumonia is generally good. Kochman has said that half the fatal cases of pneumonia in childhood are not due to the pneumonia as such but to its severe complications. The prognosis, in other words, is highly dependent upon the presence of certain complications.

When one considers the complications common in pneumonia, pleurisy comes to mind first. Pleuritic involvement occurs so often, particularly of a dry



character, that it probably should not be definitely considered as a complication but rather as part of the pneumonic process. In the majority of pneumonias of the lobar type there is a small effusion present at some time in the course of the illness. When this effusion becomes purulent, we are dealing, of course, with an empyema, and to my mind empyema is the most important complication of lobar pneumonia. It is important because its presence adds to the gravity of the illness and because it is only by proper recognition and treatment of it that good results can be obtained. Too, it is the most common of the serious complications, occurring in from 10 to 20 per cent of the cases of lobar pneumonia of pneumococcal origin, particularly in types I and II cases. Empyema is an uncommon complication following bronchopneumonia and when it does occur is usually of streptococcal origin. Empyemas as we see them in lobar pneumonia are, of course, primarily of pneumococcal origin which would be expected in view of the highly predominant pneumococcal causation of the preceding or accompanying pneumonia. In small infants, particularly below the age of 2 years, we frequently may see a rather large empyema appearing early in the course of the pneumonia. This type of empyema is particularly important from the standpoint of prognosis and treatment in small children. Occurring as it does with an acute pneumonia, it is indicative of a generalized pneumococcal infection which has invaded the lung and pleura at the same time. In my experience, the majority of children presenting such findings have had a coincident positive blood culture. The high mortality of pneumonia in children under 2 years of age can be largely explained by the generalized nature of the infection of which empyema is only a part. This synpneumonic empyema is particularly important further in that the effusion which is present may be quite large and, accompanying the underlying pneumococcal infection still active in the lung, greatly increases the respiratory difficulty. For that reason it should be recognized early and treatment instituted which should always consist of conservative measures, namely, aspiration. In contradistinction to the synpneumonic empyema, we have the more common type, particularly in older children, in which the empyema is purely a postpneumonic process. Here again we are dealing with a complication which increases the gravity of the prognosis. Again the age of the patient has a great bearing on the mortality, ranging as high as from 60 to 80 per cent in children under 2 years of age and 10 to 20 per cent in older ages.

In my opinion the more conservative the regime of treatment in the care of empyema in any child, particularly in those under 2 or 3 years of age, the better the outcome. Most of the postpneumonic types have a favorable prognosis while those occurring at the height of infection are more serious and the danger is increased by too radical drainage. The slogan, "Be early to aspirate and slow to oper-

ate" is a valuable one. It is well-known that types I, II and XIV tend to cause the most pleuritic involvement as well as most cases of pneumococcal meningitis, peritonitis and otitis media.

Probably the most common complication of pneumonia in childhood is acute otitis media which occurs roughly in from 20 to 25 per cent of the cases. Frequently, due to the associated stiffness of the neck and the slight head retraction which may accompany this condition, the physician is suspicious of the presence of pneumococcal meningitis. Needless to say, a careful scrutiny of the tympanic membrane associated with an examination of the spinal fluid will differentiate, prove or disprove the presence of either condition.

Tympanites must be considered a complication in pneumonia which carries with it a good deal of dread. It is no doubt true that abdominal distension of a marked degree should be rightly regarded as a complication and it is probably most frequently the result of a partly parietic bowel with associated loss of vasomotor tone.

Purulent pericarditis, nephritis, pneumococcal peritonitis, meningo-encephalitis, heart block and superficial abscesses are some of the much less common complications, but since they are occasionally seen it is well that the physician watch for their occurrences and appreciate the proper methods of handling them. Heart weakness, which is so commonly dreaded in the adult with pneumonia, is usually not present in the young infant except in instances of congenital heart disease or in cases which are overwhelmingly septic and toxic from the onset. Purulent pericarditis can represent one of the most serious of all complications following pneumonia and is a condition which may be easily overlooked unless the clinician is on his guard. As a general rule the diagnosis is made evident by the presence of a friction rub over the precordium which may, however, be transient or absent, and if effusion increases, heart tamponade results with the usual findings of marked dyspnea, cyanosis, engorgement of the veins of the neck, low systolic pressure with low pulse pressure and frequently a paradoxical pulse. There usually also is an area of dulness and bronchial breathing at the left base posteriorly. The diagnosis can, of course, be proven by aspiration and roentgen ray studies which are of great value. Treatment of this condition is entirely surgical and it is not entirely hopeless by any means. We recently observed such a condition in a boy of 12 years of age on whom a pericardiectomy was performed with a drainage of the pericardial cavity with complete recovery.

Pneumococcal peritonitis is also a rather rare complication but one necessitating attention because it carries with it a high mortality rate. In fifteen years at the Great Ormond Street Hospital only twenty cases have been observed. It is a condition about which there has been much speculation as to the route of infection of the peritoneum, its clinical picture and the best treatment. As you

know, it may occur as a primary involvement of the peritoneum or it may be secondary to a pneumococcal infection elsewhere in the body. Rolleston has shown that in the course of pneumonia pneumococcal peritonitis is quite rare; he observed only eleven cases in 4,454 cases of pneumonia. The clinical picture is one which is quite confusing, but it consists primarily of abdominal pain, frequently associated with diarrhea and vomiting, and abdominal distension. Since abdominal distension is so commonly seen in pneumonia, this finding is oftentimes confusing. If the disease is suspected, it is well to make vaginal cultures and blood cultures and if pneumococci are found the organism should be typed. Peritoneal puncture is particularly valuable in determining this infection. In this respect allow me to say that Denzer<sup>6</sup> is particularly enthusiastic about peritoneal puncture as the one logical, simple and safe means of distinguishing between pneumonia with distension, peritonitis secondary to appendicitis and streptococcal or pneumococcal peritonitis. It is particularly valuable to know whether or not such a complication exists in view of the fact that the pendulum of treatment seems to have swung to conservatism with a delay of any surgical operation, giving fluids and blood in the meantime until the peritoneal infection becomes localized. Mortality rates are markedly much higher in cases operated on during the presence of an acute diffuse peritonitis while, with the formation of a localized process, the mortality rate for this condition approaches 50 per cent. Generally, surgeons fear doing a peritoneal tap, but it is a procedure which I feel is relatively safe and simple and may yield considerable information which will be of value to the clinician in offering a prognosis and in combating delayed complications.

Another infrequent complication seen in pneumonia is massive collapse of the lung. Partial collapse is certainly not uncommon. This condition, of course, can be noted by roentgenogram in which a high diaphragm shows on the affected side with displacement of the mediastinum to the side of the collapse and increased density of the lung field on the affected side. Due to the suddenness with which this condition comes on, marked by associated respiratory difficulty and cyanosis, it is a condition which may greatly alarm the physician. As a general rule it persists for one or two weeks and tends to recede as the pneumonia resolves, and there is usually a gradual reinflation of the lung. Treatment would seem to consist of that necessary for the underlying pneumonia and any measures to relieve dyspnea. Since it is felt that the condition is due to intrabronchial obstruction from excessive secretions, bronchoscopic removal of these secretions may frequently produce startling results. Some of these cases which do not clear up may be the cause of bronchiectasis later. As stated previously, partial collapse with pulling of the lung over to the affected side is common and collapse of the lung due to pneumothorax also occurs, most commonly in cases of pyopneumothorax which are the

result of spontaneous rupture of a bronchus in empyema. It is well to remark here concerning delayed resolution which is certainly sometimes seen and may exist for weeks, but it usually clears up satisfactorily. Pneumococcal meningitis remains the most serious complication with a mortality approaching 100 per cent, but recoveries are being noted following use of specific sera, sulfanilamide or sulfapyridine.

#### PROGNOSIS

Just as several criteria are necessary to arrive at a diagnosis of pneumonia, so also must we consider many factors in judging the prognosis in a given case. The commonly accepted factors that seemed the most important in the past were the age of the child and the type of clinical pneumonia present. It is well-known that in many cases of pneumonia in children it is impossible to differentiate anatomically, clinically or radiologically between lobar and bronchial pneumonia. Recently several other factors have been noted in cases of pneumonia which tend to affect the prognosis. Meyers<sup>7</sup> has brought out the importance of the white count as an index to prognosis. He noted frequently that infants with persistently low white cell counts usually died, and felt that the mortality rate of pneumonia was inversely proportionate to the white cell count, unless the latter exceeded 50,000. I think this finding is particularly important. It has been my unfortunate experience to see several patients with lobar pneumonia who had been ill for two or three weeks at the time observed who presented persistently positive blood cultures, usually of type I or II organisms, and who had associated low white counts in the neighborhood of from three to six thousand. These youngsters invariably died and of course are merely examples of an overwhelming infection with lack of response on the part of the child. Regardless of the type of pneumonia, if the body shows a lack of response in forming leukocytes, certainly a high mortality results.

The presence of bacteremia, particularly if persistent, is also of importance in evaluating the prognosis. Bullowa noted that bacteremia appeared in 25 per cent of his cases with a mortality in those cases of 36 per cent, while in the children with sterile cultures death resulted in only 1.3 per cent. Personally, I always feel much safer if the child with pneumonia whom I am treating has a negative blood culture. We must remember, however, that it is no doubt true that a transient bacteremia occurs in most cases of pneumonia. Finland considers the mortality rate as three to four times higher for all types of pneumonia regardless of the stage of disease if positive blood cultures are obtained.

There is no doubt but that the prognosis in any case depends further upon an early diagnosis with a distinguishing of the type of organism present. This distinguishing of the type of organism has to do particularly with very recent work dealing with typing of pneumococci. As previously stated, it is true that from 85 to 90 per cent of the pneumonias



Table 1. Age Distribution and Mortality

539 Nonserum Treated Cases	Type XIV	Type VI	Type XIX	Type I	Unclassified	Average Mortality
262 Under 2 years						
151 Lobar pneumonia	18 per cent			5 per cent	70 in entire 539 cases, or 13 per cent	16 per cent lobar pneumonia
111 Broncho-pneumonia	15 per cent Mortality	13 per cent	7.3 per cent	23 per cent Mortality		34 per cent bronchopneumonia
277 2 to 12 years						
235 Lobar pneumonia	13 per cent	8 per cent	3 per cent	24 per cent	15 cases or 3 per cent of total	6 per cent lobar pneumonia
42 Broncho-pneumonia	15 per cent Mortality			4.6 per cent Mortality	539 cases had multiple infections	14 per cent bronchopneumonia

of childhood are due to a variety of pneumococci, and antisera have been prepared for most all of these varying types. While it is true that the majority of work of an outstanding character which would seem to indicate the importance of the typing of the pneumococcus in its relationship to mortality and treatment has been done in the field of adult pneumonia, recent work is indicative that certain types of pneumococci are particularly important in the pneumonias of childhood. Bullowa and Greenbaum<sup>8</sup> studied the age distribution and mortality for the thirty-two types of pneumococci in 539 cases of pneumonia in infants and children from 1928 to 1934. Their studies are shown in table 1.

They felt that type XIV, which occurred so commonly in infants, had a particular preference and tendency to involve the pleura, meninges and pericardium with greater frequency than many of the other types of pneumococci. Antisera seemed valuable in combating this type of pneumonia in young infants.

These investigators further studied their cases with regard to the importance of the age of the patient and the type of pneumonia on mortality. They confirmed the old idea that bronchopneumonia is at least two or three times as fatal as lobar pneumonia, regardless of the age of the child. They further showed that in a child under the age of 2 years any type of pneumonia is between two and three times as fatal as it is in a patient over the age of 2 years. To state exactly, their figures showed a mortality rate of 16 per cent in the cases of lobar pneumonia in infants and only 6 per cent mortality rate in lobar pneumonia in older children, while bronchopneumonia in infants showed a mortality rate of 34 per cent and in older children 14 per cent.

Their observations on mortality in relation to the type of pneumococcus were interesting and confirmed the opinion that the mortality rate was usually much higher for the same type of infection in infants under 2 years of age than over 2. For example, type I pneumonias in children under 2 years showed a mortality rate of 23 per cent while type I infections in children over 2 years of age showed a mortality rate of only 4½ per cent. Type XIV carries about a 15 per cent mortality rate in both older and young children.

Table 2 is compiled from further studies of these investigators<sup>9</sup> to compare common types of pneumonia in infants and adults.

## TYPING

There are three important reasons for typing the sputum of any child who has a pneumonia, as follows:

1. Determination of specific type of pneumococcus present is a prerequisite for the use of specific antisera.
2. Knowledge of the type is an aid in establishing a prognosis for the parents.
3. Knowledge of the type presupposes the development of certain complications, i. e., type I or II is associated with empyema.

## TECHNIC OF TYPING

It is well here to comment on the means of obtaining sputum or material for typing. Many men seem hesitant to try typing the sputum of a child because they consider the obtaining of such a specimen quite a difficult task. There are several ways in which one may obtain the needed specimen. The ordinary method, of course, is to have the child

Table 2. Comparison of Common Primary Types of Pneumonias in Infants and Adults

Infants under 2 years	XIV	VI	XIX	I
Adults	I	III	II	V
				Mortality
Incidence of Bacteremia	Adults		23 %	75%
	Infants		7 %	83%
	Children		4 %	25%
Average mortality for main types (Nonserum treated cases)	Adults		27 %	
	Infants		16 %	
	Children		4.6%	

expectorate in a container; but this of course is exceedingly difficult in young children who swallow their secretions. Frequently a specimen can be obtained by the use of a laryngeal swab or by gently tickling the posterior pharynx and inducing an attack of coughing. A pharyngeal swab may be taken and after insertion in broth for two to three hours a smear searched for organisms. If none are found, a mouse may be injected and in two to three hours the peritoneal fluid examined. Another method of considerable value in small children is examining the gastric contents which frequently reveal the causative organism since the secretions are swallowed. In some clinics lung suction is employed; some plasma broth is inserted in a syringe and the procedure carried out like an ordinary thoracentesis with actual lung puncture. This procedure has always seemed to me unnecessary, particularly in children. Frequently one can use the pus obtained from an empyema for typing and, of course, the growth obtained on a positive blood culture is exceedingly valuable for such purpose. However, one hates to wait for twenty-four to forty-eight hours for any growth on blood cultures.

#### INDICATIONS FOR USE OF SPECIFIC SERA

When a type specific infection is found associated with a positive blood culture, I feel one must use an antiserum regardless of the general well-being of the patient. The greater availability and the ease of typing has done much to enhance the more general use of sera. One may use the argument that lobar pneumonia in older children carries with it such a low mortality rate that it is not worth while trying to type the organism and give serum and, while that statement is true, I feel that it is indeed a risky and unwise frame of mind to always follow such an attitude. Any method of treatment which will further reduce the low mortality is certainly worth while. The physician feels much more confident if he knows he is dealing with a certain specific type of pneumonia for which he has, at his wish, a highly valuable combative agent in the form of antisera. If the patient is extremely ill with considerable cyanosis, a rapid pulse rate and a type specific infection, regardless of the absence of a positive blood culture, certainly one is wise in using serum early regardless of the low mortality rate for the older age group of children.

I think probably every child with a type II pneumonia should receive serum and even in greater quantities than we would use in type I infections. We know that type II pneumococci invade the blood stream more frequently and that in any of the bacteremic cases of whatever type the death rate is always high, whereas in nonbacteremic cases it is usually low. Usually the blood stream is invaded between the third and fourth day in types I and II, but it may be invaded late in the disease.

There are certain requisites, however, which we must bear in mind to obtain the most favorable results of sera. Early treatment is exceedingly advisable, and by early we mean treatment within

the first twenty-four to thirty-six hours. Cecil<sup>10</sup> has shown that with type I infections the mortality rate is only about 5 per cent if serum is given adequately within the first twenty-four hours, which is about one sixth of the usual death rate if the patient is not treated. The amount of serum per dose should be adequate, usually from 100,000 to 200,000 units in a given case, but a greater amount should be given in those severely ill or those with septicemia. It is further wise to permit only a short interval of from two to four hours between the administration of serum dosages. We must not forget that it is never too late to treat a patient with serum, particularly, if that patient still shows a positive blood culture.

#### REASONS FOR FAILURE OF SERUM

In some cases the severity of infection and the presence of complications may be too great at the time the serum is given. The presence of empyema greatly lessens the influence of serum, no doubt because its presence is evidence of an overwhelming infection early in the disease. If there has been a mistake in typing, naturally one would not expect valuable results from serum and we find patients who probably, because of the overwhelming nature of their infection, react poorly as far as their hematologic response is concerned and exhibit a leukopenia throughout the infection and a high mortality rate. The late usage with insufficient dosage is also a common fault. The rare occurrence of severe allergic manifestations may at times necessitate stopping the use of serum.

Giving too little serum is folly and wastes not only life but serum. We must not adhere strictly to the common idea that serum does no good after the first three days because it may do good at any time, particularly if a bacteremia is still present. The longer one waits in giving serum, the greater the expense to the patient because the greater amount of serum will be required. There is only about one chance in three hundred for a severe serum reaction, and one in four for death without.

Recently commercial companies have begun the production of rabbit serum for the treatment of pneumonia. The chief advantage of the rabbit serum is that it is cheaper than horse serum and a high titer can be obtained, especially for type III and for types against which it has been impossible to prepare potent horse sera. The chief objection to it seems to be that chills occur with considerable frequency after its use. It has been found that giving patients aspirin just before the serum is administered will frequently lessen the severity and duration of the chill.

#### TRANSFUSIONS

There is one other point which I wish to discuss in the treatment of pneumonia in childhood and that is transfusions. It is no doubt true that in the usual case of pneumonia, blood transfusions are not indicated. However, in many of the smaller children which one sees in a general pediatric



service, particularly in the poorer class of people where standards of nutrition have not been adequately maintained, one frequently notes the association of marked anemia. In these circumstances, it has long been my practice to give transfusions, and also in certain cases of pneumococcic pneumonia which are alarmingly toxic or in shock. I have also used transfusions in cases of so-called unresolved or chronic pneumonias of long duration. In these cases the results obtained are often striking. There used to be an idea that any administration of intravenous fluids was dangerous in pneumonia for fear of overloading a myocardium which was probably already overtaxed by the accompanying pneumonia. Physiology, however, does not confirm the fact that the heart can be easily overtaxed. Normal dogs have been given from 25 to 100 per cent of their total blood volume with no increase in the diastolic size of the heart. The capillaries and venules act as reservoirs for this excess fluid. Arena,<sup>11</sup> writing from Duke University, recently reviewed their experience with transfusions given to pneumonia patients, whether anemia was present or not. They observed twenty-four cases, using twenty-five for controls. The blood studies were about the same in each series. In fifteen cases the temperature fell by crisis within twenty-four hours and the disease seemed to be definitely shortened in all cases by about two days. The severe dyspnea and cyanosis were often improved and the mortality rate was also lowered. The reasons for improvement in such cases seem uncertain. The improvement is not due merely to lessening of the anemia. It may be true that blood so given stimulates the production of segmented polymorphonuclear cells. Hemogram studies in their cases showed an increase in segmented cells and a decrease in nonsegmented forms at the time of crisis. It is, of course, probably true that with the blood one introduces neutralizing antibodies or some nonspecific protein reaction.

#### SULFAPYRIDINE

Present reports in the literature seem to indicate that we are at the dawn of a new era in the treatment of pneumococcic infections in general. This optimism is possible because of the development of a derivative of sulfanilamide, namely, sulfapyridine, commonly known as M and B 693, or Dagegan, proposed by the British chemist, Whitby,<sup>12</sup> in May 1938. Flippin and Pepper<sup>13</sup> were the first in America to report on the use of this drug in pneumonia, using it in four adult cases of pneumococcic origin, all of which recovered promptly. They<sup>14</sup> have since reported its use in one hundred typed cases of pneumococcic pneumonia, nearly all of which were adults, with only four deaths, three of which were type III infections. There were no deaths in twenty-six cases of type I infection. Hartmann<sup>15</sup> and his associates at the St. Louis' Children's Hospital have reported the most extensive series using this drug in the pneumonias of childhood. Eighty children with different types of pneu-

mococcic infections, forty cases definitely proved to be pneumonia confirmed by roentgen ray and fluoroscopic examination, a few complicated by empyema, several cases of pneumococcic peritonitis and three cases of pneumococcic meningitis, were included in their report. They studied the sulfapyridine content of the blood, blood counts and values of the methemoglobin in these cases. The most striking observation in the cases of pneumonia was the quick drop of temperature to normal in from twenty-four to thirty-six hours in practically every case. Several cases of bronchitis, which were assumed to be of pneumococcic origin, were also dramatically improved. In the instances of pneumococcic peritonitis associated with nephrosis the results were likewise striking. In the total series of forty cases of pneumonia there were but three fatal cases, two of which were in infants with bronchopneumonia which was proved not to be of pneumococcic origin, and one death in an older child with severe laryngo-tracheitis who died twelve hours after treatment was begun. The types of pneumococci isolated from their cases were I, IV, VI, XI and XIV. Two out of three cases of pneumococcic meningitis recovered. No effect was observed in staphylococcic infections, dysenteries and influenzal meningitis. These authors felt that in spite of the small number of patients treated, their results were confirmatory of the favorable reports concerning the use of the drug in adults and should prompt its early use in suspected or proven pneumococcic infections in childhood.

MacColl<sup>16</sup> at Duke University has recently reported the use of the drug in thirty-three children, thirteen of the cases being pneumococcal infections and all of which recovered completely. The drug was used in eight cases of *Staphylococcus aureus* infection with no particular value.

It is only natural that some derivative of sulfanilamide would be investigated for the combating of pneumococcic infections since we are all familiar with the marked effect which that drug has upon beta hemolytic streptococcic, meningococcic and gonococcic infections. In fact, several investigators have felt that sulfanilamide itself would act upon the pneumococcus but that its effect was notably lower than its effect on hemolytic streptococci. I have observed a continuance of the life of a child with pneumococcic meningitis beyond the expected period of two or three days by the use of sulfanilamide. Many bacteriologists have noted a marked similarity between the pneumococcus and hemolytic streptococcus, and noted that the immune reaction developing in diseases due to infections by either of these organisms was similar. Therefore, any drug which could be shown experimentally to elevate the bacteriocidal power of the blood as well as the bacteriostatic power of the serum against the pneumococcus would be expected to bring about a response in the body similar to that seen in cases of hemolytic streptococcic infections treated by sulfanilamide. Sulfapyridine seems to

be the drug which is capable of producing just such a response in cases of pneumococcic infections.

The mechanism by which the drug works is probably that of being a bacteriostatic agent. We know that recovery from pneumonia depends largely on the development of antibodies, particularly at the time of the crisis. Sulfapyridine seems able to inhibit the spread of infection but, if no immunity response develops, there may be a recurrence of symptoms. Herein lies one of the greatest uses of specific antisera and it may turn the tide toward recovery; hence it is necessary to know the specific type of the infecting pneumococcus even when using sulfapyridine. The drug presents certain advantages over serum therapy in that its use lessens the necessity for typing and the identification of the organism, and thereby may spare the patient from the discomfort secondary to procedures necessary to obtain material for typing. I feel, however, that one should not adopt the policy of failing to investigate the sputum of the child who has pneumonia just because one is using sulfapyridine. Organisms other than the pneumococcus cause pneumonia and in most of these instances sulfapyridine would probably not be of any value. The use of the drug also eliminates the risk attached to serum therapy and, furthermore, it affords the child rest when needed most because of the simplicity with which it can be administered.

Unfortunately, there are a few dangers attendant to the use of this drug, most of which seem to be rather insignificant, however, as far as its usage is concerned in childhood. Probably the commonest reaction is nausea and vomiting, but the newer use of the drug by rectum will probably lessen that phenomena. Cyanosis may be quite evident but rarely is sufficiently important to necessitate stoppage of the drug. If one is interested in knowing whether the cyanosis is due to the drug or to pulmonary or cardiac involvement, the intravenous use of methylene blue will aid and the cyanosis will be lessened thereby if due to the drug. Like any drug which contains an amine radical attached to the benzene ring, we must watch for the toxic effects on the blood and blood-forming organs, the usual developments being either a hemolytic anemia or agranulocytosis. Both of these developments, however, seem to have been exceedingly rare in the cases reported to date. Hematuria also may occur occasionally.

Encouraged by these reports, the author has administered the drug to twelve children in the last two months, all of whom had pneumococcic pneumonia clinically and by roentgenogram and with type specific sputum. The response has been dramatic in each instance and no deaths resulted nor any complications. The drug was given by mouth, crushed in milk or fruit juice, in dosages of .2 gram per kilogram. There were no noticeable reactions and little or no vomiting. Cyanosis of a mild degree developed in several cases but in no instance re-

quired methylene blue intravenously. No skin rashes or blood changes were noted.

I feel that if no improvement occurs within from thirty-six to forty-eight hours, one must consider such a definite non-response to the drug as indicative of other causation. The advisability of using antiserum in a proven type specific pneumococcic infection exists in such instances. Certainly, this drug seems to hold promise of being the most notable achievement of our therapeutic armamentarium for pneumonia. Its complete field of clinical usefulness remains to be seen. It may be that the eventual recommended treatment will consist of a combination of this drug and a specific serum. We must not lose sight of the fact that most therapeutic discoveries are originally hailed with enthusiasm and may later be discarded. We must remember also that the use of specific serum has given consistently favorable clinical results in pneumonia when administered correctly. There are so many factors which alter the end result in a disease like pneumonia that it will necessitate the observation of thousands of carefully controlled cases with particular study as to comparative etiology, clinical types, bacteremia and seasonal virulence of the infecting agent before we can completely evaluate the clinical worth of this new therapeutic agent. It is my own feeling, however, that we are at the threshold of a new era in the successful treatment of pneumococcic infections, not only in children and infants but in adults as well.

To me, the final outcome in any given case of pneumonia in childhood depends upon the age of the child, the type of infecting organism, the clinical type of pneumonia produced, the presence or absence of positive blood culture, the body response as shown by the leukocytic picture, the ability of the clinician to detect early and treat rationally any of the complications with a carefully supervised use of sulfapyridine in the pneumococcic and streptococcic types, always mindful of the potential and actual value of specific antisera in those pneumococcus pneumonias not responding to the azo dyes.

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#### BIBLIOGRAPHY

1. Trask, James D.: *Practice of Pediatrics*, W. F. Prior & Co., 1936, vol. 2, ch. 48.
2. Laughlin, G. F.: *Pneumonia Following Nasopharyngeal Injections of Oil*, *Am. J. Path.* **1**:407, 1925.
3. Waring, J. O.: *Am. J. M. Sc.* (March) 1933.
4. Waldbott, G. L., and Snell, A. D.: *J. Pediat.* **6**:229 (February) 1935.
5. Parmelee, A. H.: *M. Clin. North America* **22**:55 (January) 1938.
6. Denzer, B. S.: *J. Pediat.* **8**:741 (June) 1936.
7. Meyers, H. F.: *Am. J. M. Sc.* (February) 1931.
8. Bullowa, J. G., and Greenbaum, E.: *Am. J. Dis. Child.* **53**:22 (January) 1937.
9. Bullowa, Jose, and Gleich, Morris: *Am. J. M. Sc.* **196** (November) 1938.
10. Cecil, Russel L.: *J. A. M. A.* **108** (Feb. 27) 1937.
11. Arena, Jay: *J. Dis. Child.* **54**:23 (July) 1937.
12. Whitby, L. E. A.: *Lancet* **1**:210 (May) 1938.
13. Flippin, H. F., and Pepper, D. S.: *Am. J. M. Sc.* **196** (October) 1938.
14. Flippin, H. F.; Lockwood, John S.; Pepper, D. S., and Schwartz, L.: *J. A. M. A.* **112** (Feb. 11) 1939.
15. Barnett, H. L.; Hartmann, A. F.; Perley, Anne, and Ruhoff, M. B.: *J. A. M. A.* **112** (Feb. 11) 1939.
16. MacColl, W. A.: *J. Pediat.* **14** (March) 1939.



## TREATMENT OF DEPRESSION AND MELANCHOLIA

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Depression has been defined as a sinking below the surrounding level.<sup>1</sup> It has also been defined as a dejection and a sinking of spirits; and the state of being depressed as a state of being below the normal functional level. Melancholia has been defined as a mental disease marked by apathy and indifference to one's surroundings, mental sluggishness and depression; also as a symptom occurring in psychoses, marked by depression of spirits and by a sluggish and painful process of thought. The close student will keep these definitions in mind when he analyzes his cases in light of the present day attitude expressed through psychobiology and psychopathology.

In selecting my title I have been guilty, perhaps, of transgression against the orthodox way of discussing medical subjects in that I am proposing to discuss the treatment of a symptom, not the therapy of a disease.

The average practitioner usually feels inadequate when called upon to make a definite diagnosis of a mental condition. He has little trouble, however, in recognizing the symptoms of depression and melancholia. The practitioner who is engaged in general practice almost always is the first representative of the medical world to contact these cases, and upon his shoulders rests the responsibility of providing adequate and correct medical treatment at a time when the greatest amount of good can be done and when great harm can result from neglect or improper treatment.

It is of vital importance to remember that depression is a symptom of an abnormal reaction of the organism to its environment. It is likewise important to analyze the depression thoroughly to determine if it is a pathological depression; that is, is the amount of depression more intense than the average reaction of persons of similar cultural background under similar circumstances? Unfortunately the mistake of minimizing the symptoms and failing to recognize that the depression is pathological is often made. The conclusion is too frequently made that the patient has plenty of reason to worry when careful consideration will almost always lead the examiner to the conclusion that the depression is much more than should be expected under the circumstances. Pathological depression always comes from within, although environmental forces are important and at times significant in the total analysis of the case.

Every case must be analyzed as an individual problem in which the patient's present reactions are studied in light of his own individual past and his past reaction patterns. Thus, it is possible to

propose an equation made up of the following variables: the patient's past emotional reaction to burdensome type stimuli arising in his environment; the patient's present state of functional tone; the degree of burdensomeness of the present stimulation, plus the patient's age. These factors must be considered in order to determine the presence of an abnormal mental state. After the presence of such a state has been determined and treatment instituted, this formula must also be used to determine progress and recovery.

These determinations do not lend themselves to straight cause and effect, as do conditions such as appendicitis, but must be analyzed in more than one dimension. Most medical thinking is in black and white. That is, a condition either is there or it is not there. Psychiatry has had to move into the grays, the variations, in order that its principles can be defined and made understandable. So we must use several variables rather than the two commonly employed in analyzing disease, that is, degree of potency of infecting agent and resistance of the host. An example may explain the use of the formula in the individual patient.

### REPORT OF CASE

A. B., aged 46, came to us for study. All her life she had been conservative and restrained. Her thought processes, while accurate, were slow and methodical. She tended to foresee disaster in minor events. At the time of consultation she was faced with a financial problem as the result of the economic state of the time and of the prolonged illness of her husband, as well as a developing menopause with its disturbing sensations and the fears which women have of this period of life. With this history, therefore, and from the known fact that with advancing age the human mind becomes more conservative, more unwilling to expand activities and more subject to depression and ideas of reference, her symptoms of depression and infrequent crying spells were understandable as a natural, physiological reaction to the environment. No medical treatment was recommended. Recovery from her symptoms would ensue only when her environmental problems were solved.

Advice leading toward psychotherapeutic help was given and she was urged to return for conference. Rapport, however, was not well established and the patient was not satisfied. She consulted another physician who gave her massive doses of an estrogenic hormone for some months. There was no change in her mental state. Then her husband died. He had some large life insurance policies and when the estate was settled and her natural grief relieved, her "symptoms," which were not symptoms at all, disappeared and the patient "recovered" from a condition that she had never had and which had been diagnosed as involutional melancholia.

This case raises a point as to the interpretation of all psychoses. Many physicians believe that correction of the environmental factors will correct the symptoms of any true psychosis. This is not true. A psychosis indicates a loss of real insight in nearly every case and the patient will project his symptoms into his new environment. The paranoid schizophrenic patient who feels that the people next door are talking about him will find some

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new group when he moves to a new town or another part of the city. If our patient had had a true involutional melancholia she would promptly have changed to some other reason for her melancholia when her troubles that she was worrying about were relieved. Correction of true mental disease comes not from shifting the environment but from learning how to meet the environment; that is, it comes from within, not without. In involutional melancholia this is more true than in most types of psychoses.

Involutional melancholia is a descriptive term used to designate a certain type of mental state or reaction characterized by melancholia and developing during the involutional period of life, or the decline. This condition was considered as a separate entity by Kraepelin,<sup>2</sup> placed by Dreyfus<sup>3</sup> as a subdivision of the maniacal depression or affective psychoses, and from the standpoint of classification has been the subject of controversy for many years. I consider this controversy academic within the purposes of this paper and refer the student to Jelliffe,<sup>4</sup> Strecker and Ebaugh,<sup>5</sup> Henderson and Gillespie<sup>6</sup> and many others. The present day concept of etiology is not academic. It should be discussed because it will throw light upon all the depressions and melancholias and will have an influence on the treatment program and the prognosis as given by the physician.

Modern psychobiology is not psychoanalytical in the restricted sense, yet the entire life's experience of the organism and its biology must be considered because of its influence on the presented symptoms of the patient at the time of the illness. Palmer and Sherman<sup>7</sup> in a recent publication discuss involutional melancholia from this standpoint in detail and have devised the conception of "the involutional melancholia process." This indicates a pattern of personality traits and total concept of the disease which characterizes it not only at the involutional period but throughout the life of the individual, and places the etiology in the psychobiologic field and not in the endocrine. They have shown quite conclusively that the condition is progressive throughout life and the actual symptoms develop in those individuals whose reaction patterns show marked introversion, strong obsessional character, voluntary repression, sexual maladjustments, sadistic and masochistic traits and hyper-religious trends. Rigidity of personality, especially in the unconscious adaptive mechanisms which control or in these cases strangle the instinctive forces, is the most constant characteristic, both in the prodromal stage and after the psychosis manifests itself, as there is little or no fluctuation of reaction or content. The menopause is shown to be only a precipitating situation of a somatopsychic type, that is, a trauma possessing symbolic character. It is only one of many possible precipitating situations. That the menopause has a psychic and not a chemical importance is confirmed by Farrar and Frank<sup>8</sup> who assert that there is no greater incidence of

mental disabilities in the fifth decade than at other times. They say further that it is not the physical menopause or the preceding menstrual difficulties but the individual outlook on these states that causes trouble. Palmer and Sherman<sup>7</sup> assert that there is a definite tendency for the psychosis not to appear until five years after the menopause, which should eliminate a glandular, chemical etiological concept. They found in their analysis that disordered menstrual life of a chronic nature with an improper attitude toward the menopause was a factor in only slightly over one third of the women. They feel their work shows that this condition is a definite syndrome and should be classified as an entity, not as a subdivision of the manic-depressive group. Werner<sup>9</sup> and his coworkers have propounded the endocrine background and, because this assumption is concrete and definite, it has fixed itself in the minds of the practitioners to the great benefit of the manufacturer but of little or no benefit to the patient.

Carlson<sup>10</sup> found that there was no difference in the amount of female sex hormone excreted in the urine of ten cases of involutional melancholia as compared to the expected amount excreted by a like number of nonpsychotic women passing through the menopause. He suggested that this finding confirmed the assumption that there were other factors besides the endocrines in this condition.

It has been the purpose of this study to analyze involutional melancholia somewhat in detail because it is one term that the practitioner knows well and one entity that he diagnoses readily and which he himself treats with endocrines, usually without improvement of the patient, much to the bewilderment of both physician and assured relatives. If this condition, therefore, is removed from the one dimensional field and is placed in the psychobiologic field where the cause has many facets, then the failure of estrogenic substances to give relief is easily understandable, and so-called success from these measures resolves usually into pure *post hoc propter hoc* analysis. Involutional melancholia must be considered as a reaction of psychopathological character with a poor prognosis and requiring treatment, as do all other mental abnormalities, by a psychobiologic approach.

Most physicians recognize this need in handling all other forms of depression and melancholia whether they are called depressed schizophrenia, simple melancholia, anxiety neurosis or manic-depressive psychosis, and now we must definitely include involutional melancholia. I do not infer that these conditions are the same. They have one thing in common. Depression with or without melancholia, as previously defined, is the predominant emotional content. Any accompanying symptoms may be present such as delusions, agitation, ideas of reference, feelings of unreality, hypochondriacal tendencies and abnormal behavior. Since so many patients consult physicians and give as their chief



complaint depression with or without melancholia, and since the handling of these cases is so important in the early stages in order to prevent, if possible, later developments, I have selected this symptom as the keynote of this discussion.

The first thing that should be done is to take a careful history as one would in any other medical problem. This should determine not only the variables discussed earlier but find out what other symptoms may be present as well as the various psychobiologic traumas and the individual's individual reaction to them. During this examination the physician will begin to get an impression of benignity or malignancy, and if he is understanding of human reactions he will begin to formulate a method of attack. He should keep in mind that this, his first contact with the patient, is probably the most important one. At this time he establishes the patient's foundation for confidence in him or he loses it. If the latter happens, he will probably never be able to regain it and all chance of his being able to help his patient will be lost.

He should guard his own words well. He should let the patient do the talking as much as possible and should only lead the discussion, not commenting until he is absolutely sure of his case. He is dealing with a sick patient, a sensitive patient who is apt to misinterpret ill-chosen words. The usual comment "don't worry" is similar to Canute's traditional attempt to stop another irresistible force. The depressed, melancholic patient cannot stop worrying until the causes of the worry, the inner causes, have been corrected. It is wiser for the examiner to avoid all form of advice in the early stages of the study, even that advice which might be considered comforting.

Any physical factors present must be studied and analyzed in the light of their influence upon the presented symptoms. They should be corrected as every other irritating influence is corrected when possible, but their importance must be analyzed from the standpoint of psychobiology. Correction of these factors alone will not cure the patient.

The placement of the patient is of importance. Suicide is a constant danger and whenever there is this possibility steps must be taken to prevent it. Any person who is depressed may commit suicide if the right provocation arises. It is estimated that there were over 18,000 known suicides in 1936 in the United States<sup>10</sup> and, as we all know, many reports of suicides are suppressed. The total number must have been much larger. The suicide death rate is higher than for appendicitis, yet physicians continue to take a half-hearted interest in psychiatry. Practically every person committing suicide suffered from a depression reaction resulting from an abnormal mental state. Any patient who consults a physician and gives a chief complaint of being worried or depressed is a potential suicide and prevention of suicide must be one of the first thoughts. No time should be lost in considering this factor and in bringing the possibility to the notice

of the family. They should be told to be observant but not, of course, be too watchful as that would upset the patient greatly. At the first suspicion the patient should be protected by suitable means. New moves on the part of the physician and family frequently have the tendency to bring about a climax which will lead the patient to suicide. Placing the patient in a hospital for observation is one common precipitating influence and nurses always must watch for this possibility. Suitable window guards are worth while precautions and will prevent many needless tragedies.

After several conferences, the physician will begin to get an impression of the severity of the condition. A good rule is to determine first if the condition is pathological, i. e., is it out of proportion to the expected reaction of similar individuals in similar circumstances? When the physician is convinced that the condition is pathological, he should attempt to classify it as benign or malignant. This differentiation can be made only as the result of experience, patience, good listening and an analysis of the accompanying symptoms. The following generalizations may be helpful in this evaluation.

*Presence or Absence of Other Psychotic Symptoms.*—It is unusual for the depressed patient to be entirely free of other symptoms, but the severity of the condition can be gaged in direct proportion to the number and severity of other symptoms such as delusions and hallucinations, hypochondriacal conceptions, marked agitation, over-talkativeness, and a narrowed outlook which centers every thought on the person. These are evidences of a severe, malignant condition. Simple depression alone or a fluctuation of moods with alternating periods of well-being are usually evidences of a relatively benign condition.

*Insomnia.*—Sleeplessness is usually an indication of a severe condition. Many patients with severe melancholias, however, sleep well at night, but it is well to remember that when a patient has great difficulty in sleeping his condition is probably malignant.

*Progressive Loss of Weight and Other Evidences of Improper Metabolism.*—If the physician finds that the patient has been going down physically rather rapidly in the few months before the initial consultation, he should consider the process rather malignant in character. Carcinoma is not the only condition that produces a rapidly failing health in the middle-aged person.

*Rapidly Developing Appearance of Age.*—The patient in the late forties and beyond will age rapidly as the result of a malignant depression or melancholia, and when this symptom is pronounced the physician should conclude early that a malignant process is present. This aging is not due to arteriosclerosis or glandular dysfunction as is shown by the fact that with recovery a part of the youth is regained. It has the prognostic significance of warning the practitioner that simple

measures probably will not be helpful and little time should be wasted in their trial.

*Failure to Respond to Simple Procedures.*—Few physicians are competent diagnosticians of fine psychiatric differentiations. It is frequently desirable that the family physician treat the benign cases by one or more of the simpler methods which I will outline. Minor errors in interpretations will be made and cannot be avoided. The physician, however, should heed the red signals of warning when, after several weeks of therapy of several types, no results are apparent. The patient then must be considered to be suffering from a malignant process and one of several special procedures requiring special training must be selected for the patient. The exact one will depend entirely upon the type of case.

#### TREATMENT

The physician always must keep in mind that he is treating the patient from the beginning of his contact. The psychobiologic aspect of the case and the psychopathology must be constantly in the foreground, regardless of the type of medicine used or the specific measures employed to relieve definite physical disorders.

The treatment of these conditions always should be individualized. It is impossible to generalize about psychotherapy. Each case must be handled as an individual problem, but certain rules are important.

*Avoid Negative Suggestions.*—It should be kept in mind that these patients as a rule are apt to look on the dark side of every problem and to be pessimistic about their condition. The therapist must always be as cheerful as possible about the several factors, either physical or mental. He must take time to go over every factor of the case and explain every symptom and every discomfort in simple words so that all fears of serious physical illness will be put to rest. He must be patient about this and, if necessary, he must go over these problems several times in order to make the true status of affairs completely understood.

*Develop Positive Thinking.*—During every contact with the patient, positive thoughts must be put forward and every effort made to develop an optimistic viewpoint toward life and its problems. The practitioner should call upon his experience to compare the patient's reactions with those of patients he has previously talked to who manifested the same reactions to similar problems. Many people feel that certain of their habits and their troubles are distinctive and different from those of everybody else, and it is helpful if they can be made to realize that most people have the same types of problems. They can be shown how somebody else solved his problems and how to apply these principles to their own. The important thing to impress on the patient is that these feelings of depression and melancholia which are so unpleasant are due to the individual's reaction, his inner emotional re-

sponse, and that it would be futile to make any drastic changes in the environment as nothing could be accomplished. The patient must face his problems, not run away from them. Physicians frequently advise that these patients take trips, move to new neighborhoods and in other ways spend money which could be much better spent on proper medical treatment. The problem must be corrected from within, not without.

*Emotional Background to Physical Type Symptoms.*—The emotional background must be discussed frequently with the patient in great detail. Emotional disturbances can produce functional changes in activity of the various organs, can increase the severity of discomforting symptoms which have a physical background and may lead to pain and discomfort which have no organic or pathological basis. These points must be kept in mind in the analysis of the case during the preliminary studies, and must be discussed thoroughly with the patient throughout the time that he is under the care of the physician. Emotional instabilities must be talked over, an attempt must be made to lessen the impact on the organism and to build up a resistance of the organism to the impacts.

*Guarded Prognosis as to Effect of Correction on Physical Disturbances.*—The average physician in practice today has had a splendid mechanistic training and a poor functional one. He is apt to conceive of surgery and drugs directed at structural and functional disorders as the complete approach to these problems. He is prone to promise his patients and the relatives too much from these corrections. It is true that corrections of pelvic displacements and removal of foci of infection are frequently beneficial in these cases, but every physician has in his files many reports of cases that have not been benefited by these measures. The family loses faith when promises are not fulfilled. The physician should take the attitude and pass it on to the patient that physical correction measures are only part of the treatment and will help only if the psychotherapeutic measures are also successful. No matter what other measures are used, the psychopathological condition is the first consideration and must always be kept in mind and constantly attacked from beginning to end.

*Sex and Sex Problems.*—There is much misunderstanding about the sex aspect of life and its relation to depression. There are many sensational speakers and writers who have played upon the morbid curiosity of the public and have warped the teachings of Freud to such an extent that there is a definite idea that all mental ills result from unsatisfied sexual impulses. The physician must put this part of life into its true place in life's experiences. He should point out to this type of patient that sex, while important, is not the only emotion and that sexual impulses are natural and normal and should be satisfied but do not have to be for the good health of the individual. Improper and extramarital satisfaction frequently causes great



harm and seldom helps the situation. During the last six months I have had two patients consult me who were advised by other physicians to resort to sexual acts outside the social code. The results were disastrous. It is my firm belief that no physician should ever advise a man or woman to do this. The symptoms must be corrected and controlled within the social structure, otherwise the "sin" will prey on the susceptible minds to the extent that the depression is definitely increased.

These selected concepts are but a few of the many aspects of psychotherapy which every physician can carry out in his private practice and which will benefit the patient greatly. Every mental and emotional disturbance demands for proper handling a conception of the basic principles of psychobiology and psychopathology, and regardless of other measures these must be applied. There are many pharmacological aids to psychotherapy that have been proposed and used more or less successfully, depending upon the intelligence and insight of the physician. These measures are suitable for office practice and will help the physician by producing some symptomatic relief and some lessening of depressions so that his psychotherapy will be more effective. He should never forget that these are only symptomatic treatments, not curative. Correction comes only from the proper balancing of the combined approach. These measures are beneficial in what we have chosen to call the benign depressions, and should be tried on the malignant types only for the purpose of trial and as aids in diagnosis. If these measures are going to help they will do so almost at once. If improvement is not seen within about three weeks, a change must be made to something else. After a failure with three or four of these measures, the physician must realize that his patient probably has a malignant type which requires special handling by a psychiatrist with one or more of the measures which I will discuss.

*Nutrition.*—It might seem unnecessary to discuss nutrition but many physicians fail to realize the importance of general physical health in these patients. They frequently have anorexia. They have obsessions about certain foods and many patients come to us markedly underweight and showing distinct evidence of avitaminosis. The patient with the more malignant types such as involutional melancholia always lose weight, sometimes in spite of a rather full diet. This problem must be given a place of paramount importance. High caloric diets, additional vitamins, especially vitamin B and nicotinic acid, and frequent feedings should be one of the first thoughts. The patient's food habits should be catered to when possible in order to get cooperation. Obsessions about food must not be allowed to stand in the way of a full diet. Patience and good suggestive therapy will frequently overcome these obsessions. In certain severe cases, 10 units of insulin one half hour before meals, or protamine zinc insulin, 20 units

in the morning, is helpful because it stimulates the appetite and helps general assimilation. This small dose should not produce shock.

*Sedatives.*—Frequently sedation of the ambulatory patient seems mandatory. If possible, this should be avoided but when necessary great care must be used. All sedatives are toxic. Many confusional states result from these drugs and many patients admitted to the state hospitals have a psychosis which is nothing but the delirium resulting from a prolonged overdose of drugs. For example, Wagner and Bunbury<sup>11</sup> in 1930 reported that in 500 consecutive admissions to the Colorado Psychopathic Hospital 7 per cent of the patients were suffering solely from chronic bromide intoxication. Harding and Harding<sup>12</sup> pointed out in 1934 that from 3 to 5 per cent of admissions to state hospitals were because of bromide intoxication. Hanes and Yates<sup>13</sup> studied the reports of routine blood bromide determinations on all admissions to three state hospitals in the Carolinas. Sixteen per cent of the recent admissions had blood bromide determinations above 75 mg. per cent and 9.5 per cent above 100 mg. per cent; 50 mg. per cent is frequently enough to produce the clinical manifestations of mild intoxication. They point out the rather marked upward trend in the incidence in the last few years. Only about one fourth of these patients show a rash and this skin manifestation cannot be used as a determining factor. A blood bromide determination is the only sure way to determine the presence of bromide intoxication. Bromides will increase the depression and the types of medicines that the patient has been using should be carefully studied by the physician as to their possible etiological influence. Barbitol is no less dangerous. I<sup>14</sup> have pointed out the dangers and habit-forming potentialities of the barbiturates. When any sedative drugs are used the physician should dispense them himself and should not dispense them in the original package or in the original distinctive capsules. The patient should never be given any clue as to what he is getting, else he will soon fall into the habit of self-administration with its resulting disasters of habit formation, intoxication and aggravation of symptoms. Sedatives cannot be substituted for psychotherapy and should be used only as an adjunct when absolutely necessary.

*Endocrine Therapy.*—Endocrinology is advancing so rapidly that most of us cannot keep pace with the scientific leadership. Therefore, we get most of our information from the detail men and salesmen. The fact that endocrinology is an exact science and treatment is a deficiency type in almost every case seems to have been lost sight of. Certain symptoms mean certain deficiencies and certain glandular preparations are indicated. This is specific therapy and if the proper diagnosis is made results should be apparent almost at once. If these results are not obtained early, the diagnosis is wrong and the treatment is not only futile but harmful as the

patient loses confidence in his physician. Unfortunately, some practitioners have at times had a "shot gun" attitude toward gland therapy and every mental patient is given a liberal dose of the newest gland preparation for as long a period as he will continue to come to the office. As far as is known, there is no mental disease that is due exclusively to glandular afuction or dysfunction. Every patient has a strong psychopathologic content which must be considered. Exact diagnosis must be made and, if it is definitely determined that glandular dysfunction is present, suitable specific treatment should be given. If the diagnosis is correct, results will be seen soon. The three components usually indicted in these cases are the thyroid, the ovaries, i. e., whole, and the estrogenic hormones. Thyroid therapy frequently is given in these cases because of a low normal basal metabolism rate of from -10 to -20. It has been our experience that many patients with depression show a low basal rate which returns to normal when the depression is relieved. It is extremely doubtful if thyroid is ever of any value in these cases. Ovarian therapy is likewise of little or no value. The major controversy rages around the estrogenic substances, theelin being the one trade-marked item that is most commonly known. Werner and his associates have made successive reports which indicate a specificity in involutional melancholia. My objections to this theory have been pointed out previously. There are additional arguments against the specificity of this preparation. Hoch and MacCurdy<sup>15</sup> in 1922 reported that 60 per cent of a series of 67 cases of involutional melancholia recovered without any specific treatment. Werner's reports have been some better than this, but his small series still falls definitely within the mathematical possibility of sampling error and any mathematician will tell us that these statistics, as compared to the report of Hoch and MacCurdy, prove nothing. When we consider other reports such as those of Schube, McNamamy and Trapp,<sup>16</sup> who treated ten cases of involutional melancholia with theelin and saw no results in any patient, some doubt must be cast on the specific results.

Results of our own series of twenty patients with involutional melancholia (up to 1938) treated with theelin were sixteen with little or no change, two noticeably improved and two apparently well. The last two were rather mild in their manifestations. It is true that our doses were only about 6000 units as compared to the now recommended 20,000 units or more per week. During the last two years a number of patients suffering from involutional psychoses have been admitted to the Neurological Hospital who had been given massive doses of theelin for several months in spite of the fact that the patient showed either no improvement or became progressively worse.

It is also of some importance that no standard textbook on psychiatry recognizes endocrine factors as other than psychogenic ones. Physicians

are too prone to forget that many patients recover whether they are treated or not and will attribute recovery to their treatment. Physicians as a whole should be more objective and mathematical in their analysis of their results as well as the results reported by others. No drug or treatment measure should ever be accepted as specific until hundreds of patients have been treated and the results found to be completely superior to former reports made before that particular drug was known or used.

Hawkinson<sup>17</sup> reported 1,000 patients with distressing symptoms during the menopause, usually of a physical type, treated with estrogenic substances. He reported complete recovery in ten weeks with proper treatment. Improvement was gradual. I think we can conclude from this that if theelin is used improvement should be noted in two or three weeks. If not, then the physician is probably on the wrong track and other methods must be given a chance.

*Hematoporphyrin.*—This preparation has been used extensively abroad in the treatment of depressions and to some extent in this country. Its use is based on Huhnerfeld's<sup>18</sup> observation that injections of this substance increased motor activity in animals. He treated thirteen patients with psychotic depressions and eleven were improved. These results have never been duplicated. Angus<sup>19</sup> found that of one hundred and thirteen patients with depressions, fifty-seven (50 per cent) were much benefited. However, this result is not as good as Hoch's and MacCurdy's report on spontaneous remissions with no specific therapy previously quoted (60 per cent), so simple mathematics bring us to the conclusion that the drug is of no value in the treatment of these conditions.

*Benzedrine.*—Because benzedrine is beneficial in narcolepsy and has a distinct stimulating effect on certain individuals, it has been used extensively in the treatment of depressions. Wilber, MacLean and Allen<sup>20</sup> reported a series of thirty-two with 80 per cent improved. Anderson<sup>21</sup> reported a series of thirty-three. Sixteen could not be completely treated because of untoward effects, and eleven of the remainder seemed to be helped. These results are somewhat better than those of Hoch and MacCurdy but still fall within the limits of sampling error and, therefore, no specific significance must be attached to this drug. However, it is useful at times as an adjunct and aid in raising the patient toward his normal level so that psychotherapy will be more beneficial. The physician, however, must treat this drug as a potentially dangerous one which may stir up his patient to a marked degree and lead to tragedy. We do not as yet know what structural or functional damage may result from an overdose. The drug should be dispensed by the physician and only a limited supply given at any one time. It must be given with caution and only as an aid to psychotherapy.

*Histamine Phosphate.*—In 1936 Marshall<sup>22</sup> proposed the concept of psycho-allergy. The hypothe-



sis pointed out the many common factors between allergy and psychotic processes. From this it was a natural step to the trial of nonspecific desensitizing agents. Marshall and Tarwater<sup>23</sup> reported their results in all types of psychoses. Eight depressed patients were treated and six showed improvement. We must criticize this report on the same mathematical basis that we have the others. My own experience with the drug covers three cases; one was improved and two showed no change. I feel that with certain patients who demand mechanical help this drug is probably the one to use when there is no specific indication for anything else. It must be given with the idea that psychotherapy is the principal factor of treatment and that the drug is not a specific treatment but may assist in improving the physician-patient relationship. It is much better than hit or miss endocrines or such supposedly tonic preparations as sodium cacodylate.

#### SPECIALIZED PROCEDURES

The physician will be disappointed with his results with these methods in many cases of apparently simple, benign depressions, and probably in all of the malignant ones. Failure with these relatively simple procedures does not mean a hopeless outlook for the patient. Psychiatry today can offer much but unfortunately the procedures are complex, require special training and experience and are usually an approach by a group rather than by an individual. They must always be applied in a specially equipped hospital with a complete, competent, well trained staff. While some of these procedures seem on the surface to be purely mechanical, the psychotherapeutic aspect is the most important. In those cases where simple procedures have failed, the physician should place his patient in the hands of the psychiatrist for special therapy. We must warn against the hit or miss application of these procedures. Every patient presents certain symptoms and from these symptoms the experienced therapist will draw his conclusions as to which method is indicated. Great harm can be done by applying the wrong treatment and by the improper application of psychotherapy during the course of these treatments. Proper application of the properly selected treatment will almost invariably produce the desired results in even the most resistant malignant depression or melancholia. No attempt will be made to discuss the details of applying these various procedures. We will simply point out the present status of the procedures as they apply to the conditions under discussion.

*Psychoanalysis.*—This highly specialized form of psychotherapy is in wide use today in the treatment of all forms of mental disease. Theoretically it should, in skilled hands, correct and relieve every patient. Practically, there is so much of an interplay of personalities, i. e., therapist and patient, that failure is common due to difficulty in establishing perfect contact. It has one other objection,

economic. The procedure lasts many months and is expensive. For this reason its use is still restricted to the wealthy.

The patient with advanced or severe psychosis cannot be approached by this method and in patients in whom cooperation is not good little can be done. Less formal types of psychotherapy must be applied and, in conjunction with special procedures, seem in most cases to be equally effective. Analysis has a distinct place in the treatment of certain selected convalescent patients and others of the resistant milder types.

*Prolonged Barbiturate Narcosis.*—Bleckwenn<sup>24</sup> seems to be the first who published a report of this procedure, which consists of maintaining the patient in a state of narcosis through the use of various combinations of barbiturates for from several days to, in some cases, three weeks. The procedure is of value in the maniacal, disturbed patients. It seems to have some value in certain types of depressed or melancholic patients as shown by the report of Witt and Cheavens.<sup>25</sup> In their series there were twenty-seven patients with depression, melancholia or anxiety. Four recovered, eleven improved, and twelve were only slightly improved or unimproved. It is readily apparent that in general these results are far below the 60 per cent we have set for our standard. However, certain types of patients are helped more than others and a few of the patients left the hospital in less than two months. By personal communication I know that the authors are no longer using this treatment for malignant depressions and melancholias. The procedure is not without danger as several deaths have been reported.

*Prefrontal Lobotomy.*—This neurosurgical procedure was first applied by Moniz.<sup>26</sup> The operation consists of surgically severing part or all of the connections between the extreme tip of the frontal lobe on one side and the rest of the brain. It is based on certain clinical observations and the student is referred to Freeman and Watts<sup>27</sup> who have more or less pioneered the procedure in this country. Results are at times amazing and the patient returns to normal within a few days. The procedure has considerable danger and has been dropped by most in favor of metrazol convulsive shock, except in a few selected resistive cases.

*Insulin Shock Therapy (Sakel).*<sup>28</sup>—Ever since insulin shock was introduced in this country it has been applied to resistant cases of all types. It is still the treatment of choice in certain selected types of disturbed, delusional, confused early schizophrenia, but singularly fails to affect favorably a good percentage of those patients with a high anxiety, depression or melancholic content in their psychosis or neurosis. We have treated twenty patients of this type with this procedure. Six recovered, two improved and twelve were either unchanged or, after showing improvement under treatment, relapsed when the treatment was stopped. Almost everybody has given up its use

in favor of metrazol convulsive shock in all types of depressed, anxious or melancholic patients.

*Metrazol Convulsive Shock.*—The use of metrazol (cardiozol) in the treatment of mental diseases, primarily schizophrenia, was first proposed by von Meduna<sup>29</sup> in 1935. The procedure gradually has been gaining favor and in many hospitals has completely replaced insulin shock in the treatment of schizophrenia. A great interest in its use in agitated depression and involutional melancholia was stimulated by Bennett<sup>30</sup> who reported ten successive patients with these malignant depressions completely corrected by short courses of metrazol shock. The procedure consists of the injection of certain amounts of the drug rapidly into the vein. This is immediately followed by a generalized convulsion lasting from one half to two minutes. Following this there is usually a period of excitement and confusion lasting for from a few minutes to an hour or two. The procedure is repeated every two to four days, depending upon the condition of the patient, for from six to twenty reactions. Throughout the confused period suggestive therapy is applied and in the interim between shocks general psychotherapy is vitally important. Fractures and dislocations do occur but are relatively rare. Complications and death have occurred but are extremely rare.

The results, however, absolutely warrant its use in spite of the rare complications as it is reserved for those cases that apparently were hopeless under former methods. We always advise the use of the simpler procedures for a sufficient length of time before resorting to metrazol. However, any case, no matter how apparently mild it may seem, that does not respond to simple psychotherapy, endocrine preparations, surgical corrections or simple office procedures should have metrazol, and no time should be wasted. The earlier the treatment is given in certain cases the better the results.

In order to conform with our previous reports, we have taken the last twenty patients of the depressed type treated with metrazol as our series for this paper. Two of these patients have since died of causes apparently not in any way related to the treatment. The other eighteen are all at home living apparently normal lives. Two of these eighteen relapsed but additional treatments corrected the relapse. Three of the patients have some minor defects and fifteen seem to be completely well. This result does not lend itself, of course, to much better mathematical analysis than those already studied, due to the small series. The true importance of treatment is that these patients had an average stay in the hospital of about five and one half weeks and only four and three fourths weeks under treatment. These results are somewhat better than my earlier report<sup>31</sup> which I attribute to the fact that most of these patients had more psychotherapy than the earlier series.

Most of these patients had been under the care of physicians for several years before admission to

the hospital. They had had theelin and whole ovarian therapy and at times sedatives until they were toxic and confused. Diagnoses had been involutional melancholia, senile dementia, anxiety neurosis, depressed type of manic-depressive psychosis, neurasthenia, schizophrenia or dementia praecox, myocardial disease or some other classification. The important point is that they were all depressed, pathologically anxious or melancholic, had been treated intensively by accepted office procedures with no results, and by metrazol convulsive shock were returned to their normal and are at home with their families. These results have been no different from those of other hospitals and clinics that have used this treatment.

There are few contraindications but great care must be used in the presence of malnutrition, organic heart disease or arteriosclerosis. We have treated one patient 73 years of age with senile heart disease and an arteriosclerosis with an excellent result.

On the surface the procedure seems so simple that it could easily be given in the home or even in the office. Psychiatrists believe that this is a distinct mistake and that these treatments should never be given except in a psychopathic hospital. A trained team of operators is necessary to prevent minor complications such as cuts and bruises, which are inexcusable, and to lessen the incidence of fractures and dislocations. Out of over 500 convulsions given at the Neurological Hospital, we have had one fracture of the head of the humerus and no dislocations. Tongue bites and other minor traumas are practically unknown.

The after-convulsive period of confusion may be prolonged or may be delayed, not coming on until the next day. During this stage expert psychiatric nursing is necessary and suitable protection of the type found only in a psychiatric hospital or ward is vital. During the recovery process the patient may be outwardly calm but in an inward turmoil. Suicidal attempts are frequent at this stage and will be successful if watchfulness and skilled care are dispensed with. Fears are lulled by apparent cooperation and a general improvement.

There are many other reasons against the use of this procedure indiscriminately, but the most important is the necessity of skilled psychotherapy at appropriate times during the course of this procedure. Great harm may be done by a chance remark at the wrong time. A poor outcome may result if proper psychotherapy is not applied at the right time. The physician must be skilled and must understand the principles of the basic sciences of psychiatry, psychobiology and psychopathology. Without this he should no more attempt this procedure than he would attempt an appendectomy without a basic knowledge of anatomy and pathology.

#### SUMMARY

A careful analysis of the literature and of the reported results from the use of drugs, chemicals



and endocrine preparations leads us to the conclusion that none of these procedures are specific if we apply the mathematician's methods of statistical analysis.

Correct psychotherapy must be applied at all times, no matter what chemical agent is used as an adjunct for the purpose of making psychotherapeutic contact easier.

Reports indicate that metrazol convulsive shock is today the best chemical approach in properly trained hands. While the combined series is as yet too small to prove anything statistically, many cases that have been given every other type of treatment without results have responded to this treatment in a few weeks. It must be remembered that this is probably only a means to make psychotherapeutic contacts easier to accomplish and that some day it may be shown that the good results are produced entirely by suggestion.

2625 Paseo.

#### BIBLIOGRAPHY

1. Stedman, Thomas Lathrop: Stedman's Medical Dictionary, ed. 7. William Wood and Company, 1922.
2. Kraepelin, in Bleuler, E.: Textbook of Psychiatry. Translated by A. A. Brill, New York, The Macmillan Company, 1924.
3. Dreyfus, in Henderson and Gillespie.<sup>6</sup>
4. Jelliffe, S. E.: Some Historical Phases of the Manic-Depressive Synthesis, *J. Nerv. & Ment. Dis.* **73**:353 (April) 1931.
5. Strecker, E. A., and Ebaugh, F. G.: Practical Clinical Psychiatry, Blakiston, 1935.
6. Henderson, D. K., and Gillespie, R. B.: Textbook of Psychiatry, ed. 4, New York, Oxford University Press, 1936.
7. Palmer, Harold D., and Sherman, Stephen H.: The Involutional Melancholia Process, *Arch. Neurol. & Psychiat.* **40**:762 (October) 1938.
8. Farrar, C. B., and Franks, R. M.: Menopause and Psychosis, *Am. J. Psychiat.* **10**:1031 (May) 1931.
9. Werner, A. A., et al.: Involutional Melancholia; Probable Etiology and Treatment, *J. A. M. A.* **103**:13 (July 7) 1934.
10. World's Almanac, 1939. The New York World Telegram.
11. Wagner, Carl P., and Bunbury, D. Elizabeth: Incidence of Bromide Intoxication Among Psychotic Patients, *J. A. M. A.* **95**:1725, 1930.
12. Harding, G. T., Jr., and Harding, G. T., III: Bromide Intoxication, *Ohio State M. J.* **30**:310, 1934.
13. Hanes, Frederick M., and Yates, Anne: An Analysis of Four Hundred Instances of Chronic Bromide Intoxication, *South. M. J.* **31**:667, 1938.
14. Robinson, G. Wilse, Jr.: Addiction to Barbituric Acid Derivatives, *J. Missouri M. A.* **34**:374-378 (October) 1937.
15. Hoch, A., and MacCurdy, J. T.: Prognosis of Involutional Melancholia, *Arch. Neurol. & Psychiat.* **7**:1 (January) 1922.
16. Schube, P. G.; McNamamy, M. C.; Houser, G. F., and Trapp, C. E.: Involutional Melancholia, *Arch. Neurol. & Psychiat.* **38**:505 (September) 1937.
17. Hawkinson, L. F.: The Menopausal Syndrome, *J. A. M. A.* **111**:390-393 (July 30) 1938.
18. Hühnerfeld, J.: Neue Wege in der Behandlung der Melancholie, *Psychiat.-neurol. Wehnschr.* **33**:170, 1931.
19. Angus, L. R.: The Hematoporphyrin Treatment of Depressive Psychoses, *Am. J. Psychiat.* **92**:877 (January) 1936.
20. Wilber, D. L.; MacLean, A. R., and Allen, E. V.: Proc. Staff Meet., Mayo Clinic, **12**:97 (Feb. 17) 1937.
21. Anderson, E. W.: Further Observations on Benzedrine, *Brit. M. J.* **2**:60 (July 9) 1938.
22. Marshall, Wallace: Psychoallergy in General Practice, *Clin. Med. & Surg.* **44**:149-151 (April) 1937.
23. Marshall, Wallace, and Tarwater, James S.: Use of Histamine Phosphate and Peptone Solution in the Treatment of Neuroses and Psychoses—Preliminary Report, *J. Nerv. & Ment. Dis.* **88**:36 (July) 1938.
24. Bleckwenn, W. J.: Production of Sleep and Rest in Psychotic Cases: Preliminary Report, *Arch. Neurol. & Psychiat.* **24**:365 (August) 1930; Narcosis as Therapy in Neuropsychiatric Conditions, *J. A. M. A.* **95**:1168 (Oct. 10) 1930.
25. Witt, Guy F., and Cheavens, Tom: Prolonged Barbiturate Narcosis in the Treatment of Acute Psychoses, *South. M. J.* **29**:574 (June) 1936.
26. Moniz, Egas: Tentatives opératoires dans le traitement de certaines psychoses, Masson, Paris, 1936.
27. Freeman, Walter, and Watts, James W.: Prefrontal Lobotomy in the Treatment of Mental Disorders, *South. M. J.* **30**:23 (January) 1937.
28. Sakel, Manfred: Schizophreniebehandlung mittels Insu-

lin-Hypoglykämie sowie hypoglykämischer Schocks, *Wien. med. Wehnschr.* **84**:1211 (Nov. 3), 1265 (Nov. 17), 1299 (Nov. 24), 1326 (Dec. 1), 1353 (Dec. 8), 1383 (Dec. 15), 1401 (Dec. 22) 1934; **85**:35 (Jan. 5), 68 (Jan. 12), 94 (Jan. 19), 121 (Jan. 26), 152 (Feb. 2), 179 (Feb. 9) 1935.

29. von Meduna, L.: *Ztschr. f. d. ges. Neurol. u. Psychiat.* **152**:235, 1935.

30. Bennett, A. E.: Convulsive Shock Therapy in Depressive Psychoses, *Am. J. Med. Sc.* **196**:420, 1938.

31. Robinson, G. Wilse, Jr.: Convulsive Shock Therapy in the Involutional Psychoses, *J. Kansas M. Soc.* (January) 1939.

32. Carlson, C. C.: Female Sex Hormones in Involutional Melancholia, *Northwest Med.* **55**: (February) 1937.

## CASE REPORTS

### SUBARACHNOID HEMORRHAGE AS A PRIMARY MANIFESTATION OF THROMBOCYTOPENIC PURPURA

#### SPLENECTOMY AND RECOVERY

J. J. GITT, M.D.

AND

E. J. WEISS, M.D.

ST. LOUIS

Subarachnoid hemorrhage is quite common as a clinical entity but not as an acute primary manifestation of thrombocytopenic purpura.

Strauss and Tarachow<sup>1</sup> in their review of 105 cases of spontaneous subarachnoid hemorrhage record one case of thrombocytopenic purpura with a terminal cerebrospinal hemorrhage. Geiger<sup>2</sup> reported only twenty-five cases of intracranial hemorrhage complicating thrombocytopenic purpura up to 1932. He added two cases, one patient with subarachnoid hemorrhage which cleared up but later developed a hemiplegia and died, and another who died in convulsions. He points out that Longcope<sup>3</sup> in 1919 noted that in thrombocytopenic purpura hemorrhages in the central nervous system are usually multiple and vary in size from petechiae to large extravasations. While the symptoms and signs vary greatly depending on the size and location of the lesion, Longcope<sup>3</sup> suggested that all cases could be classed in four main groups. He said: "One group presents chiefly the appearance of meningitis with slight focal or generalized neurologic signs. Another group, and probably the largest, exhibits definite localizing signs, among which hemiplegia is common. A third group includes cases of coma, sometimes with convulsions. An occasional case offers no definite neurologic symptoms or signs and the hemorrhage is discovered unexpectedly at autopsy."

Garvey and Stephens<sup>4</sup> reported a series of thirty cases of thrombocytopenic purpura with ten deaths, seven of which were due to intracranial hemorrhage. In this series one patient with intracranial bleeding recovered following splenectomy.

Recently we had occasion to study and observe a case of thrombocytopenic purpura with subarach-

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noid hemorrhage presenting the appearance of a meningitis with generalized neurological findings. This patient recovered with no complications following a splenectomy. We are reporting this case because of its unusual clinical onset and uncomplicated recovery.

#### REPORT OF CASE

P. B., white male, aged 18, was admitted on the neurological service of the St. Louis City Hospital on August 9, 1938, complaining of severe headache, vomiting and pain in both legs. The patient was apparently in good health until two days before admission when suddenly, while at work, he developed a severe frontal headache which was not relieved by aspirin. He immediately went to bed but his headache continued unabated and the patient spent a restless night. The following morning he complained of mild nausea and shortly thereafter had projectile vomiting on several occasions. The vomitus was coffee-ground in appearance.

On the morning of his admission to the hospital he experienced a dull aching pain along the posterior aspects of both thighs and calves in addition to his headache and vomiting. This pain was so intense at the time of entry that any attempt at manipulating his lower extremities evoked cries of pain.

*Physical Examination on Admission:* Temperature was 99.8 F. (oral); pulse rate was 92; respiration rate was 22. The patient was a well developed and well nourished white male. The face was flushed and the patient appeared acutely ill. He lay in bed on his right side with the thighs and legs held in a semi-flexed position, groaning with pain and holding both hands to his head. He was somewhat lethargic but rational and fairly well oriented. On the integument over the anterior aspects of the thorax, abdomen and proximal portions of the thighs there were scattered numerous pin point hemorrhages which did not fade on pressure. The head showed no abnormalities and no evidence of trauma. The pupils were dilated, round, equal and reacted promptly to light and on accommodation. An ophthalmoscopic examination revealed no abnormalities. The ears and nose were normal. The tonsils were small and covered with numerous petechial hemorrhages from 1 to 2 mm. in diameter. The vessels on the postpharyngeal wall were hyperemic. The heart and lungs were normal. Blood pressure was 110/70. On abdominal examination the spleen was just palpable. Neurologically there was moderate nuchal rigidity with bitter complaints on flexion of the head. Kernig's sign was present bilaterally; deep reflexes were diminished throughout and equal; the skin reflexes were normal; sensory examination was not entirely satisfactory but there was hyperesthesia to pin prick over both lower extremities. The examination, otherwise, gave normal findings.

*Laboratory Findings.*—On August 9, red cell count was 4,370,000; Hb. (Sahli) 90 per cent; white cell count 14,650 with slight shift to the left on the hemogram; blood nonprotein nitrogen 17 mgm. per cent; fasting blood sugar 72 mgm. per cent; bleeding time was in excess of 16 minutes; clotting time was 2 minutes; the clot showed poor retractility; capillary resistance was within normal limits; blood platelet count was 3,610. The coffee-ground vomitus gave a positive test with benzidine reagent. The fluid from lumbar puncture was grossly bloody with an initial pressure of 250 mm. of water and the fluid when centrifuged was xanthochromic. Roentgenogram showed the skull and long bones to be normal.

On August 10, red cell count was 3,610,000; Hb. (Sahli) 70 per cent; blood platelet count 4,000.

On August 13, red cell count was 3,250,000; Hb. (Sahli)

60 per cent; bleeding time in excess of 15 minutes; clotting time 3 minutes; blood platelet count 4,070; white cell count 14,000.

On August 29, red cell count was 5,080,000; Hb. (Sahli) 90 per cent; bleeding time 2 minutes; platelet count 10,960; clot retraction time 15 minutes.

On May 6, 1939, red cell count was 4,560,000; white blood count 8,000; Hb. (Sahli) 85 per cent; platelet count 12,500; bleeding time 3 minutes; clotting time 15 minutes.

Our clinical impression was that the condition was a thrombocytopenic purpura with subarachnoid hemorrhage.

In an attempt to reduce the patient's intracranial pressure, 50 cc. of 50 per cent sucrose was given intravenously every four hours and codeine and aspirin were prescribed for pain. In addition, he received thromboplastin intramuscularly, 2 cc. daily, and viosterol, 30 drops orally three times daily, in an effort to check bleeding, but his condition gradually grew worse. He continued to complain of severe headache and leg pains and his general appearance became more toxic.

Neurological examination on August 13 revealed a definitely rigid neck and bilateral Kernig's sign. The plantar and abdominal reflexes were normal but both cremasterics were sluggish. All deep tendon reflexes were absent. The pupils were round, equal and reacted well to light. On this date it was noted for the first time that the retinal veins were full and there was definite blurring of the margins of both disks. In the left fundus there was noted a large hemorrhage about the inferior temporal vein just beyond the disk margin. Temperature varied from 99 to 101 F.

The patient failed to respond to medical treatment and, because his clinical picture was growing steadily worse, it was decided to do a splenectomy. Preparatory to this procedure the patient was given three blood transfusions of 400 cc. on August 13, 150 cc. on August 14 and 250 cc. on August 15. His red blood cell count rose to 5,030,000.

On August 15 there was present for the first time a large fresh hemorrhage in the right retina just below the disk margin and both disks showed early choking, more pronounced on the left.

Splenectomy was performed on August 16. The spleen was approximately three times normal size and was removed without much difficulty. The postoperative course was uneventful. On the first postoperative day the patient appeared more alert and his headache was subsiding. He no longer complained of leg pains. By the third postoperative day the headache had completely disappeared and the patient was alert and cheerful. The vomiting ceased. The bleeding time on the fourth postoperative day had dropped to three minutes. Reexamination of the eyegrounds at this time showed two diopters of choking in the right eye and three in the left. No new hemorrhages were noted in the right retina but in the left two or three fresh hemorrhages were seen just above and to the nasal side of the disk.

The patient continued to show marked clinical improvement and was discharged from the hospital on August 29. Neurologically there was no sign of neck rigidity and Kernig's sign was negative. The deep tendon reflexes were active and equal. The eyegrounds at the time of discharge from the hospital were essentially as noted with the exception that the choking had largely subsided although the margins of both disks were still somewhat hazy. The patient was advised to return to the outpatient clinic for further observation.

He was seen in the outpatient clinic on October 2, 1938, approximately one month after his discharge from the hospital, at which time he reported that he was working every day and had no complaints whatsoever. Examination of the eyegrounds at that time showed complete absorption of the retinal hemorrhage in the right eye and almost complete absorption of



those in the left eye. Both disks were well outlined and appeared normal. He was seen again in the clinic on December 5, 1938, and reported he was gaining weight and had remained symptom free. The eye-grounds showed no abnormalities whatsoever. On February 23, 1939, the patient came back for his last visit and stated that there were no complaints.

#### CONCLUSIONS

1. A case of thrombocytopenic purpura manifesting itself in an acute form as a spontaneous subarachnoid hemorrhage which failed to respond to medical treatment but which recovered following splenectomy is presented.

2. Interesting eyeground changes are recorded.

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#### BIBLIOGRAPHY

1. Strauss, I., and Tarachow, S.: Prognostic Factor in Spontaneous Subarachnoid Hemorrhage, *Arch. Neurol. & Psychiat.* 38:239:37.
2. Geiger, A. J.: Purpura Hemorrhagica With Cerebrospinal Hemorrhage, *J. A. M. A.* 102:1000-1 (March 31) 1934.
3. Garvey, P. H., and Stephens, D. J.: Purpura Hemorrhagica With Intracranial Hemorrhage, *New York State J. M.* 36:97-101 (Jan. 15) 1936.
4. Longcope, W. T.: Purpura Hemorrhagica With Intracranial Hemorrhage, *M. Clin. North America* 3:279-300 (September) 1919.

## GRAFT IN SITU OF SKIN COMPLETELY AVULSED

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Skin that has been completely avulsed can be grafted in situ successfully. Even though the piece of avulsed skin retain no connection with the bed from which it was accidentally torn, it can be put back onto the original bed and survive. The replaced skin, moreover, need not be small; and a large, full thickness piece can remain viable after reapposition.

Success in such procedures has, in the past, usually been limited to the replacement of amputated finger tips, as in the cases of J. B. Brown,<sup>1</sup> and of Finney, Sr.<sup>2</sup> In the present instance a graft to the dorsum of the middle phalanx of a finger survived. The index finger of the patient was caught in an electric wringer and a full thickness piece of skin 7.5 square centimeters in area was torn from the finger and fell into an empty laundry tub from which it was salvaged and replaced by operation onto the original wound. The graft survived.

#### REPORT OF CASE

White woman, aged 75, a laundress, was referred by Dr. Walter Fischel on February 9, 1939. Patient had caught the left index finger in an electric clothes wringer. She stopped the wringer but could not withdraw the finger and on reversing the machinery not only liberated the finger but also tore a piece of skin completely from it. The accident occurred about 2:55 p. m.

From the Department of Surgery, Washington University Medical School, and St. Luke's Hospital.

**Physical Examination:** The positive findings were limited to the left index finger. There was a clean wound on the dorsum of the middle phalanx 3 centimeters long and 2.5 centimeters wide. The edges of the wound were clean cut as though with a knife. Exposed in the wound were the extensor tendon and the bone of the middle phalanx together with the capsules of both interphalangeal joints. There were in addition two lacerations extending on each side of the phalanx about 1 centimeter. There was no evidence of injury to nerve or tendon and no sign of fracture. The wound was bleeding freely. There was also a hematoma on the anterior surface of the middle phalanx. The general condition of the hand was good because the patient had just been washing clothes. No antiseptic had been applied.

**Treatment:** Search in the laundry revealed the lost skin in an empty washtub. It consisted of a 3 by 2.5 cm. full thickness layer with fat and fine blood vessels attached to the deep surface and with clean cut regular margins. After applying a temporary dry dressing to the finger, I placed the skin between two sterile pieces of gauze moistened with cold tap water and took both skin and patient to the hospital.

Operation was begun about one and a quarter hours after the injury. The piece of skin was placed in physiological saline solution at room temperature. Under sterile precautions the hand was prepared by gentle scrubbing with saline solution and green soap for ten minutes. The wound was not scrubbed and not treated with antiseptics but merely rinsed with saline solution. The hand, but not the wound, was prepared with a weak solution of iodine and alcohol.

The digital nerves were blocked with a 1 per cent solution of procaine hydrochloride. Bleeders were clamped, not tied.

We prepared the free piece of skin by carefully dissecting away all fat and blood vessels from the deep surface. After removal of hemostats from the bleeders the free skin was replaced onto its original bed and sutured with a running horsehair stitch. It appeared dead white and gave little appearance of living. Hemostasis was obtained partly by pressure and partly by deep fixation of vessels with horsehair. Two small stab



Fig. 1. A. Replacement of full thickness skin to original wound. Photograph taken on fifth postoperative day. B. Radial aspect.



Fig. 2. A. Complete take of graft. Photographed on sixty-second postoperative day. B. Ulnar view.

drainage wounds were made in the graft for drainage and no drains were used. Dressing consisted of a small marine sponge accurately applied over a gauze pattern and wet saline at room temperature. The extremity was placed on an anterior board splint.

**After-Care:** The patient was kept in the hospital following the operation for continuous wet saline dressings at room temperature. Dressings were changed in forty-eight hours and daily thereafter. The patient was discharged on the fourth postoperative day. The grafted skin was viable (fig. 1). Between the fifth and twenty-fifth postoperative days there was desquamation of superficial epithelium over a triangular area of the proximal part of the graft measuring 1 by 1.4 cm. However, there was no loss of the basal layers of the epithelium and by the twenty-fifth postoperative day complete regeneration of epithelium had occurred (fig. 2). A roentgenogram taken by Dr. C. F. Titterington showed no evidence of fracture.

The patient was last examined April 12, 1939, at which time the graft was in excellent condition and sensation was returning. There was some pigmentation. The line of union with the normal skin was barely visible and the graft was flush with the surrounding surfaces. There was slight tenderness and some keloid formation over the scar on the radial aspect of the proximal interphalangeal joint but this scar resulted from apposition of two skin surfaces and no keloid formed around the graft. Flexion of the joints was about 45 per cent normal, better than at previous examination.

#### DISCUSSION

This case history merely illustrates the successful replacement to its original bed of a full thickness piece of skin 3 by 2.5 centimeters in size. Beyond exemplifying some points in plastic surgery, it shows what may be done by saving tissues thought lost apparently beyond hope.

400 Metropolitan Building.

#### BIBLIOGRAPHY

1. Brown, James Barrett: The Repair of Surface Defects of the Hand, *Ann. Surg.* 107:965-966 (June) 1938.
2. Finney, J. M. T., Sr.; *Loc. Cit.* p. 970.

#### ACCIDENTS TO BLOOD VESSELS OF BRAIN RARELY CAUSE SUDDEN DEATH

Sudden death (within two hours) from accidents to the blood vessels of the brain is the exception rather than the rule, Hugh Page Newbill, M.D., New Orleans, declares in *The Journal of the American Medical Association* for January 20.

Interference with the circulatory system of the brain due to such accidents may be caused by hemorrhage, the formation of a blood clot in a blood vessel of the brain (thrombus) or a blood clot formed elsewhere in the body and conveyed to the brain (embolus). In either type of blood clot, circulation is interfered with or perhaps completely cut off from a certain part of the brain. In the 296 cases reviewed, Dr. Newbill found that only one sudden death due to an accident to the blood vessels of the brain occurred in less than one hour after the onset of symptoms.

Hemorrhage is more apt to be responsible if death occurs within twenty-four hours of the onset of symptoms, while the formation of a blood clot is far more common in patients surviving for more than one month. The average survival period after thrombus formation is approximately fifteen times as long as after hemorrhage or an embolus.

In the author's patients there was a distinct difference in the survival periods of the white (105.5 days) and the Negro patients (64.8 days). This difference was confined mainly to the patients with blood clots.

#### ACCURACY OF MEDICAL NEWS INCREASING

"Only those closely associated with modern trends in publication are familiar with the vast improvement that has been taking place relative to the publication of news of scientific advances," *The Journal of the American Medical Association* for January 20 declares. "A bulletin recently issued by the United Press to its bureau managers and division managers is worthy of quotation. It reads:

"It seems advisable to restate our traditional policy concerning handling stories of 'cures' or other medical developments.

"This policy, which dates back more than twenty years, is never to call anything a cure, or in fact give any publicity to any remedy of any description, without a thorough investigation.

"This rule is now being strengthened by the following:

"Under no circumstances put any story on the leased wire about a remedy. If the bureau manager is convinced that the story has merit, he should overhead it to New York for investigation and consideration there."

#### MANGANESE TREATMENT UNSATISFACTORY

The use of manganese for the treatment of various skin diseases was found unsatisfactory by Maurice Sullivan, M.D., Baltimore, in an investigation made under a grant from the Therapeutic Research Committee of the Council on Pharmacy and Chemistry of the American Medical Association, he reports in the *Association's Journal* for January 20.

Commenting on his report, the Council reaffirms its stand of many years that the results from the use of manganese preparations for the treatment of boils, skin abscesses, various acnes and inflammation of the hair sacs, especially those of the beard, are still insufficient for inclusion among its accepted products.

"In a carefully observed group of fifty-two patients with various types of acne, boils, and other skin diseases," Dr. Sullivan states, "the results of treatment with a widely advertised, well known and apparently extensively used brand of colloidal manganese hydroxide were unsatisfactory."



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FEBRUARY, 1940

## EDITORIALS

### THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.
2. The allotment of such funds as the Congress may make available to any state in actual need for the prevention of disease, the promotion of health and the care of the sick on proof of such need.
3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.
4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.
5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.
6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.
7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.
8. Expansion of public health and medical services consistent with the American system of democracy.

### PROGRAM FOR THE JOPLIN SESSION

Eight guests have accepted the invitation of the Committee on Scientific Work to present scientific papers at the Joplin Session to be held April 29, 30, and May 1, 1940.

In addition to the scientific presentations, Dr. Rock Sleyster, Wauwatosa, Wisconsin, President

of the American Medical Association and Medical Director of the Milwaukee Sanitarium, will speak on organization activities.

The guests who will give scientific presentations are Dr. Heyworth N. Sanford, Chicago, Associate Clinical Professor of Pediatrics, Rush Medical College, University of Chicago; Dr. John H. Musser, New Orleans, Professor of Medicine, Tulane University of Louisiana School of Medicine; Dr. Fred W. Rankin, Lexington, Kentucky, Surgeon, Member of Council on Medical Education and Hospitals of the American Medical Association and Delegate from the Section on Surgery at the St. Louis Session; Dr. Everett D. Plass, Iowa City, Professor of Obstetrics and Gynecology, State University of Iowa College of Medicine; Dr. Cyrus C. Sturgis, Ann Arbor, Michigan, Professor of Internal Medicine, University of Michigan Medical School; Dr. Joseph W. Gale, Madison, Wisconsin, Associate Professor of Surgery, University of Wisconsin Medical School; Dr. Alfred I. Folsom, Dallas, Texas, Professor of Urology, Baylor University College of Medicine; Dr. Louis A. Buie, Rochester, Minnesota, Professor of Proctology, University of Minnesota Graduate School of Medicine.

### WARNING AGAINST TULAREMIA

The State Board of Health has issued a warning against tularemia which all members of the profession should receive and which is particularly timely in the present months.

Twenty-five deaths from tularemia were reported for 1939 at the beginning of December and fifty-eight cases were positively identified by the laboratory of the State Board of Health in November.

Tularemia is usually contracted from dressing or eating diseased rabbits. It can be contracted through an abrasion in the skin or the organisms may penetrate the skin itself. The hunter or housewife must guard against rubbing the eyes while cleaning rabbits as that may have serious results. The use of rubber gloves during the cleaning or immediate washing of hands in some antiseptic solution afterward is the only safe course. Rabbits should be thoroughly cooked as any red juice remaining about the bones can harbor the germs and be dangerous.

Dr. Harry F. Parker, State Health Commissioner, says of the disease, "The onset is sudden, with grippe like chills, fever, sweats, severe headaches, aching pains in the back and extremities, vomiting and marked prostration. These symptoms usually follow in from three and a half to five days the time the disease was contracted. The immediate attention of a physician should be had."

Convalescence is slow and from one to three months usually is required before any work can be done. One attack of tularemia gives permanent immunity to the disease. While tularemia may be contracted from other wild game, the common source of infection is the wild rabbit.

## AMERICAN MEDICAL ASSOCIATION REPORTS ON FOURTH OF JULY CASUALTIES

The report of the American Medical Association's annual survey on injuries and deaths directly due to celebration of the Fourth of July in 1939 shows thirteen deaths, five fewer than in 1938. The total number of injuries recorded as due to fireworks was 5,560 as compared to 7,933 in 1938.

The reduction in the number of deaths and injuries is attributed largely, according to the report, to a statewide law banning fireworks in Pennsylvania. In 1938 there were six deaths and 1,702 injuries in Pennsylvania and in 1939 there were no deaths and eighty-five injuries.

The report from Missouri illustrates by contrast the advantages of statewide laws. In St. Louis where an ordinance was passed banning the use of fireworks, the number of injuries was reduced from 295 in 1938 to seventy-six in 1939. In Kansas City, with no ordinance and a population less than half that of St. Louis, the number of injuries in 1939 was 243. Among principal cities Kansas City had the worst record with a rate of 60.83 per 100,000 of population. The rate for Los Angeles was 20.91; Baltimore, 16.75; New York, 11.85; St. Louis, 9.24; Boston, 9.01; Chicago, 6.69; Cleveland, 4.66; Detroit, 4.13, and Philadelphia, 1.17.

The effects of adequate legislation are shown in the records of Utah and West Virginia as well as the record of Pennsylvania. In Utah the number of injuries was reduced from eighteen in 1938 to five in 1939 and in West Virginia from one death and forty-one injuries to no casualties in 1939.

Legislation was enacted in Indiana but did not become effective until after the Fourth of July and one death and 198 injuries were reported from that state. In Maryland, legislation was defeated and there was one death and 169 injuries reported.

Nineteen persons lost the vision of one or both eyes because of fireworks celebrations in 1939; 158 received other eye injuries. Forty-one persons lost a finger, a hand or another member and thirty-seven persons suffered other serious accidents such as internal injuries and fractures.

Reports of Fourth of July injuries were compiled by the American Medical Association from 1903 to 1916 and were resumed in 1937. The figures are compiled from reports submitted by hospitals and verified newspaper accounts. Injuries treated in physicians' offices or in hospitals which failed to return a questionnaire, of course, are not included.

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## NEWS NOTES

Dr. C. H. Crego, Jr., St. Louis, conducted a clinic for crippled children at Kankakee, Illinois, January 7 and 8 under the auspices of the Pope Foundation.

Dr. E. T. Gibson, Kansas City, was a guest of the Central Kansas Medical Society at Ellsworth, Kansas, on December 7 and spoke on "Encephalitis."

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Dr. F. C. Helwig, Kansas City, was a guest of the Kansas City Bar Association on December 14 and spoke on "Medico-Legal Aspects of Acute Alcoholism."

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Dr. E. Lee Dorsett, St. Louis, was a guest of the Monroe County (Illinois) Medical Society at Waterloo, Illinois, on December 21 and discussed "Obstetrical Anesthesia."

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Dr. Frank J. Hall, Kansas City, was a guest speaker at the meeting of the Tri-County Medical Society at Winfield, Kansas, on December 7, and discussed "The Cerebrospinal Fluid in Health and Disease."

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The Missouri Cancer Commission is receiving government owned radium on a loan basis for use at the Ellis Fischel Hospital, Columbia, according to an announcement by the United States Public Health Service.

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Dr. Quitman U. Newell, St. Louis, was chosen President-Elect of the Southern Medical Association at the meeting in Memphis, November 21 to 24, 1939. Dr. Newell will serve as President after his installation at the Louisville session, November 12 to 15, 1940. Dr. Newell has taken an active part in the Southern Medical Association for many years and served as chairman for the St. Louis session. His presidency will follow that of Dr. Arthur T. McCormack, Louisville, Kentucky, who was installed at the Memphis session. Dr. Newell is a member of the Committee on Control of Venereal Disease of the Missouri State Medical Association.

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The Central States Society of Industrial Medicine and Surgery and the St. Louis Medical Society will hold a joint program on "Industrial Medicine and Surgery" at the Statler Hotel, St. Louis, on February 9. All members are invited to attend and there will be no registration fee. The morning program beginning at 10:00 o'clock will include a paper by Dr. G. V. Stryker, St. Louis, on "Occupational Dermatitis" and discussions on "Differential Diagnosis of Back Conditions and Pain" by Dr. C. E. Burford, St. Louis, on "The Urological Viewpoint"; by Dr. Frank D. Dickson, Kansas City, on "The Orthopedic Viewpoint," and Dr. Fred W. Slobe, Chicago, on "The Industrial Viewpoint." In the afternoon the presentations will be: "Sulfanilamide Treatment of Infections," Dr. O. P. Hampton, Jr., St. Louis; "Treatment of Compound Fractures," Dr. J. Albert Key, St. Louis; "Treatment of Burns



and Their Complications," Dr. T. L. Hansen, Chicago; "Diagnosis and Treatment of Head Injuries," Dr. William T. Coughlin, St. Louis; "Diagnosis and Treatment of Pathology of Nucleus Pulposus," Dr. L. T. Furlow, St. Louis, and round table discussions on industrial problems. Following a dinner at 7:00 o'clock, Dr. Clarence D. Selby, Detroit, will speak on "The Dividends of Industrial Medicine and Surgery," and Dr. E. V. Allen, Rochester, Minnesota, on "The Health of the Executive."

The United States Public Health Service reports that treatment and laboratory facilities and services in the control of venereal disease increased between 30 and 85 per cent during the last fiscal year ending June 30, 1939. Every state health department now has a separate division or subdivision for the control of venereal disease. Approximately 103,000 persons were discharged from clinics as cured or the disease arrested in 1939 as compared with 78,000 the preceding year. Persons treated for the first time numbered 315,000 and the number of treatments administered was 8,000,000. More than 90 per cent of clinics now furnish monthly reports to the United States Public Health Service. Training centers for physicians and nurses in venereal disease control have been established in nine universities.

The National Conference on Medical Service, formerly the Northwest Regional Conference, will hold its fourteenth annual meeting at the Palmer House, Chicago, February 11. All state medical associations have been invited to send representatives to the conference which is designed to provide a medium for the verbal exchange of information on progressive medical service activities being conducted throughout the United States and to discuss the solution of problems arising from the distribution of medical service to all classes. The conference is not official nor political, is not connected with any other organization or committee and its deliberations result in no resolutions or motions. It is informal, has no dues, by-laws or formal organizational structure. The conference has been successful because it affords an opportunity for physicians who are officially associated with or personally interested in medical economics to exchange ideas for the good of the profession and the public. The 1940 program, designed to give sound practical information, includes symposia on group medical care and group hospitalization programs, the allocation of federal funds to the states, the Washington scene, effective public relations by physicians and medical welfare programs (including the federal assistance groups, outdoor relief group and medical and surgical care in hospitals). Seventeen men, representing as many states, will be on the program. Dr. L. Fernald Foster, Bay City, Michigan, is president and Dr. Forrest L. Loveland, Topeka, Kansas, is secretary. Registration is free and there are no dues.

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Nonofficial Remedies:

Abbott Laboratories

Sterile Solution Thiamin Chloride—Abbott, 250 mg., 5 cc. Bottle

Sterile Isotonic Solution Thiamin Chloride—Abbott, 100 mg., 10 cc. Bottle

Tablets Thiamin Chloride—Abbott, 6 mg.

Cutter Laboratories

Sobisminol Mass—Cutter

Sobisminol Mass—Cutter Capsules

Sobisminol Solution—Cutter

Sobisminol Solution—Cutter, Ampoules 1 cc.

Sobisminol Solution—Cutter, Ampoules 2 cc.

Eli Lilly and Company

Combined Diphtheria Toxoid-Tetanus Toxoid, Alum Precipitated, two 1 cc. vials package

Combined Diphtheria Toxoid-Tetanus Toxoid, Alum Precipitated, one 10 cc. vial package

Sobisminol Mass—Lilly

Pulvules Sobisminol Mass—Lilly

Sobisminol Solution—Lilly

Sobisminol Solution—Lilly, Ampoules 1 cc.

Sobisminol Solution—Lilly, Ampoules, 2 cc.

Sobisminol Solution—Lilly, Ampoules, 50 cc.

E. R. Squibb & Sons

Sobisminol Mass—Squibb

Sobisminol Mass—Squibb Capsules

Sobisminol Solution—Squibb

Sobisminol Solution—Squibb, Ampuls 1 cc.

Sobisminol Solution—Squibb, Ampuls 2 cc.

Sobisminol Solution—Squibb, Ampuls 50 cc.

Epinephrine in Oil—Squibb

## ORGANIZATION ACTIVITIES

### THE PRESIDENT'S PLAN FOR FEDERAL HOSPITALS

"On invitation of President Franklin Delano Roosevelt, the committee appointed by the House of Delegates of the American Medical Association to confer with federal representatives relative to the proposed National Health Program visited the White House in Washington to discuss the plan for the construction of hospitals with federal funds, first suggested by the President December 21," *The Journal of the American Medical Association* for January 20 states in an editorial.

"Representing the American Medical Association on this occasion were the chairman of this committee, Dr. Irvin Abel, and as members Drs. Walter F. Donaldson, Frederic Sondern, Walter E. Vest, Fred W. Rankin and Edward H. Cary and Dr. Austin A. Hayden, appointed by the Speaker of the House to take the place of Dr. Henry Luce, who was ill and unable to attend. Also in attendance to represent

the Association were Drs. Olin West, secretary; R. G. Leland, of the Bureau of Medical Economics, and W. D. Cutter, of the Council on Medical Education and Hospitals. At the same time there were in attendance representatives of the American, Catholic and Protestant hospital associations, including Monsignor Griffin, Father Schwitalla, Fred Carter, Dr. Bert W. Caldwell and Rev. Paul R. Zwilling. Included also at the conference were Surgeon General Thomas Parran and Dr. Joseph Mountain, of the U. S. Public Health Service, and Surgeon General Ross McIntire, of the Naval Medical Corps.

"It is reported that the President indicated again his belief that it is not desirable to enact a program with the cumbersome and expensive aspects of the National Health Program or the Wagner Health Bill, S. 1620, and also that he indicated his belief that the technic of grants-in-aid with matching appropriations might not serve to be helpful to the very areas most requiring assistance. **Furthermore, it was the President's proposal that the federal government should erect the necessary hospitals but that the requests should come from the areas needing the hospitals and that they should be locally supported and administered.** The President also emphasized the experimental and necessarily limited character of this program.

"Previous to the conference with the President, the representatives of the medical profession and of the hospitals in attendance had conferred and prepared a memorandum on the situation, which was left with the President. This memorandum follows:

"1. Hospitals to be built only where need for same can be shown. Advisory consultation in the determination of such need to be given by the state medical and hospital associations, the state health department and the county judges or officials of the counties in which such hospital services are proposed.

"2. Size of hospital to be commensurate with the needs of the community and the ability of the latter to support it.

"3. Means for the maintenance and upkeep of such hospitals rank in importance equal to that of construction.

"4. Since the important objective of the program is the service it can render, hospital construction and administration, equipment, staff and personnel should meet the standards which the American Medical Association, the American College of Surgeons and the hospital associations regard as minimal for rendering such service in the various localities. Where needed, since highly specialized facilities and personnel cannot be made available in all places, affiliation with larger hospitals or hospital centers to be had to the end that highly specialized services for diagnosis and treatment be made available to all.

"5. Maintenance of a standard of professional and hospital service that will keep it efficient and prove attractive to qualified men and women as a career.

"6. Utilization of existing facilities where possible: Under no circumstances should the program be allowed to develop into competition with the voluntary hospitals but should rather foster co-operation between the two groups.

"7. Many small communities can be better served by the utilization of bed vacancies in available existing institutions than by the construction of new hospitals, transportation and per diem expense to be borne by state and/or county funds. Where state and/or county funds cannot be provided, expense to be met by, and to be dispensed by, local agencies.

"Ambulance service and good roads will permit this type of service to operate safely, efficiently and economically in communities not financially able to support a hospital."

#### THE RECORD REFUTES CHARGES THAT A. M. A. IS REACTIONARY

"While captious critics have been denouncing the American Medical Association as reactionary and obstructive, its members have been conducting numerous and extensive experiments during the last seven years in search of ways of organizing payments for medical service and adjusting the burden of medical costs to the abilities of varying economic classes," *The Journal of the American Medical Association* for December 30 states.

"Never have so many, so varied or so significant projects been carried out in any other country. When the burden of medical care for the indigent disrupted the systems of county and township doctors, drained the resources of philanthropic organizations and became too heavy for gratuitous service by physicians to bear, the various state and county medical societies developed almost the only successful plans for efficiently distributing such resources as were available to provide medical care for the indigent.

"During the period 1932 to 1938, between 200 and 300 county societies entered into contracts with relief authorities to provide medical service for the indigent. These were organized to include such protection to the interests of the patients and the public as free choice of physician and economical administration of the always insufficient funds. A number of county societies have also experimented with medical service bureaus for the low income classes. Some of these bureaus are still in operation and have been helpful to many persons in this class in enabling them to meet the costs of needed medical care. All these plans and all those which are now in operation are considered frankly as experiments to be expanded, restricted, altered or abolished as they prove their value in protecting the health of those served. If they are not found desirable they may be abandoned. The medical society stands the loss in time and money expended, but no political, financial or occupational vested interests are created and left behind to hamper further experiments.



"Out of the extensive experience with county medical society plans sufficient knowledge has been gained to enable a number of state medical societies to undertake medical service plans on a statewide scale. At present at least fifteen states have such plans in various stages of development. These states include Arizona, California, Connecticut, the District of Columbia, Massachusetts, Idaho, Michigan, Missouri, New Jersey, New York, Oregon, Pennsylvania, Utah, Vermont and Washington. In some states such arrangements have progressed little beyond endorsement by the house of delegates of the state medical society and the appointment of a committee to prepare a plan. In California, New York, the District of Columbia and Michigan such plans are already offering their service to the public or will do so within the immediate future. In Connecticut, Michigan, New York, Pennsylvania and Vermont, special enabling legislation has been obtained to insure the legality of such plans. In most of the other states, opinions have been obtained from insurance commissioners or other state authorities that the proposed plans are permissible under existing legislation.

"There is a wide variation among these plans such as naturally accompanies the experimental stage in the establishment of any social institution. New York and Utah provide for payment of benefits in the form of cash indemnity rather than directly in service. Most of the others provide medical care under close supervision. There is some diversity in the income classes included, although most of them set the upper limit at around \$2,000 or \$2,500 for families, with a lower income limit for individuals. Missouri classifies premiums according to three classes of incomes and according to certain variations as to the number of dependents within each income class.

"The information gained from these experiments and obtainable from statistical studies of morbidity and medical care is still insufficient to afford dependable actuarial figures covering the cost of medical care given on such prepayment plans. One reason for this uncertainty is the failure of most previous prepayment plans and especially systems of compulsory sickness insurance to place safeguards around the quality of the service such as to insure that medical standards shall be maintained as high as possible. Neither has any way yet been found to estimate the increased demand for medical care that always accompanies any plan of prepaid medical service.

"In the proposed plans, prepayments vary from \$1.50 to \$2.50 a month for individuals, with a lower rate for additional dependents in the same family. Much of this variation is due to provisions which limit the service to what it is believed can be furnished at the rates charged. There are also provisions for deducting the cost of a certain proportion of the first services given in any one year from the coverage of the plan. These restrictions and the methods of acquiring members represent an

effort on the part of medical societies to approach a more nearly actuarial basis for operation and to deal honestly with those who are to receive the service. California provides that the subscribers shall pay for the first two calls in any one illness, the District of Columbia for the first \$6, Michigan for the first \$5 and New York for the first \$10 expense in any one given year. Some states also place a limit to the value of the service that is given in any single year. This is usually placed sufficiently high to cover all but the most exceptional illnesses and to make a substantial contribution where the total is not covered.

"All these plans vest control in the medical profession although several provide for lay members in their governing bodies. In all cases, arrangements are made to provide that medical standards shall be under professional control. The state medical societies have themselves provided, through appropriations from their treasuries and the gratuitous services of the organizing bodies, for the preliminary expenses of organization."

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## THE STATE BOARD OF HEALTH

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The beginning of the pneumonia control program in Missouri has been announced. To be limited at first to the eight counties maintaining full-time public health units, the State Board of Health proposes to extend the program to other sections of the state as soon as facilities will permit.

On or about January 15 the medical directors of the county health units were supplied with materials for typing, and sulfapyridine and antipneumococcic sera for the important types. The county health units will in turn supply these materials to physicians for indigent cases. Through the United States Public Health Service, the federal government has granted funds for pneumonia control in Missouri this year.

Regional conferences of public health personnel were held in December to explain the new program. Dr. H. A. Holle, United States Public Health Service regional consultant in pneumonia, attended these conferences and showed films relating to pneumonia diagnosis and therapy.

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The growth of public health nursing in Missouri was accelerated by the coming of Social Security funds to the state in 1935. The State Health Commissioner created a Division of Public Health Nursing on January 24, 1938. The staff consists of a director, a consultant in public health nursing education and two field advisory nurses.

Public health nursing, an important cog in the public health machine, has kept abreast of the development of the program throughout the state. The aim of public health nursing is to assist in the promotion of health for all citizens and this is ac-

complished by helping each county to provide and maintain health services of a good quality.

On January 1, 1936, there were twenty-nine nurses employed in rural Missouri and this number was increased to ninety-six by January 1, 1940. The ninety-six public health nurses are distributed as follows: central office, five; district and county nurses, fifty-four; county units, twenty-five; syphilis control program, five; Trachoma Hospital, four, and staff nurses in school, three.

Eight new nurses enrolled for public health training on January 1, 1940, making a total of ninety-five nurses who have been granted state scholarships.

Dr. James W. Chapman, director of the Division of Child Hygiene, was reelected Chairman of the Missouri Council of Public Welfare Agencies for the year 1940.

Organized a year ago, this council is composed of representatives of all state and federal welfare agencies operating in Missouri. It was designed to serve as a clearing house for problems affecting different agencies and to reduce duplication of effort. Throughout the past year the monthly meetings have served to acquaint the membership with the functions of all the agencies. The council serves only in an advisory capacity.

Figures relating to the distribution of dentists in Missouri were made available by the dental division recently. The following excerpt is from an article prepared by Dr. A. O. Gruebbel, director of the dental division, for the *Missouri State Dental Journal*.

"According to the best figures available, Missouri has 2,685 dentists and has a total population of 3,760,659 persons. Of all the dentists practicing in Missouri, 59 per cent are located in St. Louis and Kansas City although these cities comprise only 33 per cent of Missouri's total population. St. Louis City has 843 persons per dentist; Kansas City has 683; while rural Missouri has 2,221. Less than half the counties in Missouri maintain even this state average.

"One county with a population of nearly 10,000 persons has no dentist. Three counties with an average population of 7,907 persons have one dentist each, and eleven counties have more than 5,000 persons per dentist. The greatest concentration of dentists is in central Missouri and in counties adjacent to St. Louis and Kansas City.

"It should be remembered that an important feature of the Missouri dental health program is to encourage children to receive periodical dental attention. It can be readily seen from the above analysis that the uneven distribution of dentists creates a difficult problem in our attempt to promote an effective dental health program in every section of the state."

## MISCELLANY

### THE SIXTEENTH DECENNIAL CENSUS

The Sixteenth Decennial Census of the United States is being taken this year. The economic censuses—business, manufacturers and mines and quarries—began early in January. The domestic enumerations are scheduled for April. Thorough and comprehensive, each census will be on a national basis and, in most cases, will be conducted as a person to person affair with householders and business men interviewed by official enumerators direct. The first census was taken in 1790, the practical reason being the determination of representation in Congress. That and all succeeding censuses are provided for in the Constitution.

Answers to Census questions are required by law but the same statute requires the Census Bureau to maintain its policy of not disclosing any facts about individual persons or establishments. Individual reports are not available to any other government department and therefore cannot be used for taxation, regulation or investigation. However, while individual reports are not made public, the accumulated data will provide the most exhaustive assemblage of facts ever compiled on the population, resources, business and occupational activities of the United States, thus bringing up to date the most complete statistical record possessed by any nation.

While the data accumulated by the Census Bureau is of value and interest to many groups such as those interested in manufacturing, agriculture, wholesale and retail trade, working force in the United States and natural resources, there are few groups that gain more information than does the medical profession from the vital statistics made available through the census.

It is possible, through Census records, to make interesting comparisons, for example, of death rates prevailing around 1900 and those of today. If the 1900 figures still governed, over 450,000 more deaths would occur this year in the United States than actually will take place.

In 1900, for instance, tuberculosis caused 201.9 deaths per 100,000 population; now it causes but 53.6. Using the 1900 ratio against a present estimated United States population of 132,000,000, there are 188,500 Americans who otherwise would die are not dying this year from this cause alone—a cause which in the aggregate has cost more lives than the toll exacted in all the wars of history. This year, the prevention of deaths from tuberculosis will save more than four times as many people as the number of American soldiers killed on all the World War battlefields.

Forty years ago, influenza and pneumonia were killing about 200 people per 100,000. Now the rate is approximately 110, a saving for today at an annual rate of 117,000 lives. The diphtheria rate has been reduced from 43.3 to 2, a gain of 49,400 lives. The saving from deaths from typhoid is 44,200.

The Division of Vital Statistics in the Census Bureau keeps accurate records on the fifteen maladies against which medical science has made its greatest advances. These are tuberculosis, typhoid, smallpox, measles, scarlet fever, diphtheria, influenza and pneumonia, erysipelas, malaria, bronchitis, diarrhea and enteritis, cirrhosis of the liver, maternal deaths, congenital malformations and diseases of infancy and nephritis. For these fifteen diseases, the net reduction of deaths per year per 100,000 people has been 542, which would indicate a saving of 704,600 lives this year as against the 1900 mortality rate.

Eight causes have increased in deadliness: cancer, cerebral hemorrhage, heart diseases, diabetes mellitus, appendicitis, suicide, homicide and automobile accidents. The new death rate for these is 195 per 100,000 more



than in 1900, therefore their current claim over the number of deaths at the 1900 rate would be 253,500. By deducting this figure from the savings by medical science the net gain this year is 451,100—equivalent to the 1930 population of Arizona, New Mexico, Idaho or New Hampshire and exceeding by wide margins the total populations of Delaware, District of Columbia, Nevada, Vermont and Wyoming. Students of vital statistics, the medical profession, sociologists and laymen can find much to ponder over in these figures.

The census will furnish more up-to-date statistics covering general trends in American health, life, income, resources, virtually every angle of economic and sociological interest in the United States. The Census Bureau makes available much data that is of interest to every citizen. A few facts now recorded by the Bureau are: The United States comprises one-fifteenth of the land surface of the world and has one fifteenth of the world's population but possesses 45 per cent of the world's wealth. The United States produces 62 per cent of the oil produced in the world; it mines 35 per cent of the copper, lead and zinc and 30 per cent of the world's coal. The United States consumes 45 per cent of the world's tin, 56 per cent of its rubber and 72 per cent of its silk. Of the forty-three million automobiles in the world twenty-nine million are in the United States and twenty million of the forty-one million telephones in the world are in the United States. Of the thirty-five million bales of cotton produced in 1937, the United States produced eighteen million bales and produced one fifth of the wheat of the world. There are more students in the colleges and universities of the United States than in those of all the rest of the world put together.

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## DEATHS

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**Otto Jacob Schwer**, St. Louis, graduate of Barnes Medical College, St. Louis, 1907; member St. Louis Medical Society; aged 69; died January 9, 1939.

**Frederick L. Dod**, Kansas City, graduate of the University Medical College of Kansas City, 1904; member Jackson County Medical Society; aged 63; died January 30, 1939.

**J. Edgar Stewart**, St. Louis, graduate of the University of Pennsylvania School of Medicine, Philadelphia, 1914; member St. Louis Medical Society; Fellow; aged 49; died March 5, 1939.

**Harry Calvin Berger**, Kansas City, graduate of Harvard University Medical School, Boston, 1915; member Jackson County Medical Society; Fellow; aged 50; died March 5, 1939.

**Philip Hoffman**, St. Louis, graduate of Missouri Medical College, St. Louis, 1892; member St. Louis Medical Society; Fellow; aged 69; died April 21, 1939.

**W. E. Burke**, St. Louis, graduate of Barnes Medical College, St. Louis, 1904; member St. Louis Medical Society; Fellow; aged 67; died May 28, 1939.

**Aaron Levy**, St. Louis, graduate of Missouri Medical College, St. Louis, 1897; member St. Louis Medical Society; Fellow; aged 63; died June 18, 1939.

**Edward Schulz**, St. Louis, graduate of Homeopathic Medical College of Missouri, St. Louis, 1904; member St. Louis Medical Society; aged 68; died June 28, 1939.

**Albert E. Jones**, Kansas City, graduate of the University Medical College of Kansas City, 1908; member Jackson County Medical Society; aged 53; died July 16, 1939.

**Otto Martin Koenig**, St. Louis, graduate of St. Louis University School of Medicine, 1913; member St. Louis Medical Society; Fellow; aged 65; died July 19, 1939.

**W. L. Clapper**, Clayton, graduate of Washington University School of Medicine, 1904; member of St. Louis Medical Society; retired; aged 62; died August 4, 1939.

**Rufus C. Harris**, St. Louis, graduate of Missouri Medical College, St. Louis, 1898; member St. Louis Medical Society; Fellow; aged 63; died September 10, 1939.

**Eugene F. Hauck**, Clayton, graduate of Washington University School of Medicine, 1880; honor member St. Louis Medical Society; aged 83; died October 8, 1939.

**Aloysius Robert Holdenried**, Affton, graduate of St. Louis University School of Medicine, 1926; member St. Louis Medical Society; Fellow; aged 38; died October 14, 1939.

**Roy U. Stevens**, Kansas City, graduate of the University of Kansas School of Medicine, Kansas City, Kansas, 1921; member Jackson County Medical Society; Fellow; aged 48; died November 7, 1939.

**F. Henry Raab**, Kansas City, graduate of the University of Pennsylvania School of Medicine, Philadelphia, 1910; member Jackson County Medical Society; Fellow; aged 52; died November 16, 1939.

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## "SOLVENT" USED IN DRY CLEANING IS NEW OCCUPATIONAL HAZARD

The recovery of a young man from the effects of a three months' exposure to a "solvent" used in a dry cleaning plant is reported by Leo E. Braunstein, M.D., Schenectady, N. Y., in *The Journal of the American Medical Association* for January 13.

The case was characterized by jaundice, or yellowness of skin and eyes, brought about by the effects of the solvent, petroleum distillate (the solvent), eruption on the hands, anemia, stomach disorders and albumin and sugar in the urine. This is another occupational disorder that should receive attention, especially as the medical literature implies that it is rare for petroleum products to cause disorders of the liver. Usually they affect the nervous system.

"It has been considered safe to use 'solvent' in large quantities, and the employees handle it with impunity," he says. "I believe that the medical profession and the industry should be aware of such possibilities so that this hazard may be recognized and treated."

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## NEW ARMY MEDICAL LIBRARY AND MUSEUM

"The acquisition of a site for a new Army Medical Library and Museum building in Washington was recommended by the President in the budget for the fiscal year of 1941, which he submitted to Congress January 4," *The Journal of the American Medical Association* for January 13 states. "The budget contemplates that the Congress shall appropriate \$600,000 for the purchase of the site and for preliminary expenses in connection with the building to be constructed and that the site be selected on East Capitol Street, in Washington, adjacent to the Congressional Library group. Thus moved one step further toward fruition the hopes and petitions of physicians that a structure be provided in which the vast collection of invaluable medical literature comprising the Army Medical Library, often spoken of as the Surgeon General's Library, may be safely and adequately housed. The Seventy-Fifth Congress authorized the construction of such a building to cost \$3,750,000 but did not appropriate any money to make effective its authorization. The recommendation contained in the budget for 1941 is now before the Committee on Appropriations of the House of Representatives."

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## EXPOSURE TO TUBERCULOSIS

Occupational exposure of the hospital personnel to tuberculosis does not increase the disease or death rates except among nurses who enter training in the tuberculin negative stage, Leopold Brahdy, M.D., New York, contends in *The Journal of the American Medical Association* for January 13.

## COUNCILOR DISTRICT AND SOCIETY PROCEEDINGS

### COUNTY SOCIETY HONOR ROLL FOR 1940

(UNDER THIS HEAD WE LIST SOCIETIES WHICH HAVE  
PAID DUES FOR ALL THEIR MEMBERS)

#### HONOR ROLL

Chariton County Medical Society, December 5, 1939.

Perry County Medical Society, December 11, 1939.

Camden County Medical Society, December 18, 1939.

Miller County Medical Society, December 20, 1939.

Ste. Genevieve County Medical Society, December 22, 1939.

Clinton County Medical Society, December 23, 1939.

ASSOCIATE EDITORS: COUNCILORS OF THE  
TEN COUNCILOR DISTRICTS

#### FIRST COUNCILOR DISTRICT

A. S. BRISTOW, PRINCETON, COUNCILOR

##### Carroll County Medical Society

The Carroll County Medical Society met at the Florence Hotel, Carrollton, on January 11, for a dinner meeting.

Dr. James R. McVay, Kansas City, President of the Missouri State Medical Association; Dr. Morris B. Simpson, Kansas City, and Dr. A. S. Bristow, Princeton, Councilor, were guest speakers.

The purposes and needs in furthering the interests of legislative and progressive work of the profession were discussed.

Those present were the guest speakers, Drs. H. M. Griffith, Richmond; C. H. Reed, Hardin; Donald Dowell, Chillicothe; C. S. Austin, H. B. Scovern, R. M. Benson, W. G. Atwood, R. H. Staton and John Platz, Carrollton; A. G. Brown, Bosworth; J. H. Robertson, Hale, and B. C. Cole, Norborne.

C. S. AUSTIN, M.D., Secretary.

#### SECOND COUNCILOR DISTRICT

H. B. GOODRICH, HANNIBAL, COUNCILOR

##### Randolph-Monroe County Medical Society

The Randolph-Monroe County Medical Society met at 8:30 p. m. at the Moberly Public Library on December 12, the president, Dr. M. P. Hunter, in the chair.

The following officers were elected: President, Dr. M. R. Noland, Moberly; vice president, Dr. W. R. Langston, Moberly; secretary and treasurer, Dr. F. L. McCormick, Moberly; delegate (Randolph County), Dr. F. L. McCormick, Moberly, alternate, Dr. M. E. Leusley, Moberly, (Monroe County), Dr. M. C. McMurry, Paris, alternate, Dr. J. F. Flynt, Paris.

Dr. C. C. Smith discussed the barber examination law and moved that the Society oppose this selection of doctors for the examination and send a copy of the motion to J. H. Skaggs and the Secretary of the State Medical Association.

Dr. M. P. Hunter moved that a letter be written to the Attorney General, Mr. Roy McKittrick, endorsing his talk and commending him on it.

Dr. G. E. Grim, Kirksville, spoke on "Prostatic Diseases" emphasizing transurethral resection by the punch method.

The following were present: Drs. F. A. Barnett, M. C. McMurry and J. F. Flynt, Paris; M. R. Noland, F. L. McCormick, C. C. Smith, M. P. Hunter, J. M. Black and M. E. Leusley, Moberly; P. V. Dreyer, Huntsville, and J. P. Allen, Cairo.

Following the meeting a light lunch was enjoyed.

P. V. DREYER, M.D., Secretary.

#### Meeting of January 9

The Randolph-Monroe County Medical Society met at 8:30 p. m. at the McCormick Hospital, Moberly, January 9. The meeting was called to order by the president, Dr. M. R. Noland, Moberly.

Dr. J. A. Costrino, Moberly, was accepted to membership by transfer from the Jefferson County Medical Society.

A letter from Dr. E. E. Glenn, Springfield, Chairman of the Association's Committee on Tuberculosis, was read asking for appointment of a committee to assist in the control of tuberculosis. The president was instructed to appoint a committee.

A committee to investigate the ethics of advertising and report at the next meeting was appointed.

It was decided to invite Dr. H. B. Goodrich, Hannibal, Councilor, to a regular meeting before the Annual Session that socialized medicine might be discussed with him.

A letter regarding the correction of the barbers' examination was read and approved.

The president suggested that the Boone County Medical Society be invited to meet with the Randolph-Monroe County Medical Society on February 13. Drs. M. E. Leusley and F. L. McCormick were appointed to arrange for the meeting.

Dr. M. R. Noland, Moberly, read an interesting paper on "Toxemias of Pregnancy."

Dr. F. L. McCormick, Moberly, read a paper on "Cesarean Section."

A general discussion followed the papers.

Lunch was served in the dining room of the hospital following the meeting.

F. L. McCORMICK, M.D., Secretary.

#### THIRD COUNCILOR DISTRICT

CURTIS H. LOHR, ST. LOUIS, COUNCILOR

##### St. Louis Medical Society

The St. Louis Medical Society held its annual meeting and installation of officers at the St. Louis Medical Society Building at 8:30 p. m. January 2.

The following officers were installed: President, Dr. Herbert S. Langsdorf; first vice president, Dr. Daniel L. Sexton; second vice president, Dr. J. Paul Altheide; secretary, Dr. Jerome I. Simon; councilors, Drs. Alphonse McMahon, Joseph C. Peden, Charles H. Eyer-mann and Henry P. Thym.

The installation of officers was preceded by an address by the retiring president, Dr. Alphonse McMahon, and two vocal solos by Mrs. Carroll Smith. Following the installation the incoming president, Dr. Herbert S. Langsdorf, presented an address followed by the President's Reception.

#### FIFTH COUNCILOR DISTRICT

W. A. BLOOM, FAYETTE, COUNCILOR

##### Boone County Medical Society

The Boone County Medical Society met January 2 at the Boone County Hospital with Dr. F. E. Dexheimer presiding.



Dr. Hurley L. Motley, Columbia, was elected a member.

Dr. O. F. Bradford, Columbia, was elected a member by transfer from the Jackson County Medical Society.

The secretary read the following committees appointed by the president: Committee on Program and Entertainment, Drs. H. E. Allen, chairman, R. L. Crouch, W. B. Brown; Committee on Lay Projects, Drs. M. Pinson Neal, chairman, W. J. Stewart, Dudley S. Conley; Committee on Public Health and Legislation, Drs. Dan G. Stine, chairman, A. W. Kampschmidt, R. S. Battersby.

Dr. H. E. Carlson, Kansas City, spoke on "The Treatment of Blood and Pus in the Urine." He reviewed briefly the various significant points about the appearance of pus and blood in the urine together with suggested routine therapy and ended his discussion with an interesting presentation of roentgenograms of the genito-urinary tract of several outstanding cases.

Discussion of the paper was led by Dr. H. McClure Young and participated in by the majority of those present.

M. E. COOPER, M.D., Secretary.

### Moniteau County Medical Society

The Moniteau County Medical Society met at California on December 11.

The following officers were elected: President, John P. Burke, Jr., California; vice president, Dr. H. R. Popejoy, California; secretary and treasurer, Dr. Logan L. Latham, California; delegate, Dr. J. B. Norman, Tipton; alternate, Dr. E. A. Kibbe, California.

L. L. LATHAM, M.D., Secretary.

### SIXTH COUNCILOR DISTRICT

#### A. J. CAMPBELL, SEDALIA, COUNCILOR

#### Henry County Medical Society

The Henry County Medical Society met on January 5.

The following officers were reelected: President, Dr. R. S. Hollingsworth, Clinton, and secretary, Dr. E. C. Peelor, Clinton.

Plans for meetings during the coming year and some of the problems confronting organized medicine were discussed.

A resolution was passed concerning the death of Dr. J. R. Rogers, Brownington, who died at the Trinity Lutheran Hospital in Kansas City, December 13, following an operation for carcinoma of the stomach.

E. C. PEELOR, M.D., Secretary.

### Lafayette County Medical Society

The Lafayette County Medical Society held its sixtieth anniversary meeting at the Arcade Hotel in Higginsville on December 28.

Dr. C. T. Ryland, Lexington, president, acted as toastmaster and spoke of the history of the Society which was organized on November 3, 1879. Dr. John A. Mann, Wellington, is the only living charter member of the organization.

Dr. Robert McE. Schaffler, Kansas City, was the guest speaker.

The following officers were elected: President, Dr. G. W. Fredendall, Lexington; president-elect, Dr. W. E. Martin, Odessa; secretary-treasurer, Dr. W. E. Koppenbrink, Higginsville; reporter, Dr. E. S. Wallace, Lexington; censor, Dr. J. S. Cope, Lexington; delegate, Dr. J. S. Cope, Lexington.

Dr. T. R. Butler, Lexington, was elected an honor member.

Members of the Johnson County Medical Society and their wives were guests.

E. S. WALLACE, M.D., Reporter.

### EIGHTH COUNCILOR DISTRICT

#### H. L. KERR, CRANE, COUNCILOR

#### Dallas-Hickory-Polk County Medical Society

The Dallas-Hickory-Polk County Medical Society held a special meeting and banquet in Bolivar, December 13, in honor of the eighty-ninth birthday of Dr. J. F. Roberts, Bolivar.

Dr. Roberts has practiced medicine for sixty-seven years. He is still active, goes to his office each day and occasionally makes calls in and about town. He is referred to as "the grand old man of medicine in Missouri."

Approximately seventy-five physicians and their friends attended the banquet. Among the guests were two sons of Dr. Roberts, Dr. Wells Roberts, Altamont, Kansas, and John F. Roberts, Buffalo. Physicians from St. Louis, Kansas City, Jefferson City and sections of Southwest Missouri attended.

Dr. H. L. Kerr, Crane, Councilor of the Eighth District, acted as toastmaster.

Dr. James R. McVay, Kansas City, President of the Missouri State Medical Association, gave the principal address. He discussed socialized medicine and condemned health insurance as practiced by Germany and other dictator nations.

Dr. Kerr called on other physicians and friends for remarks.

In response to the speeches of his friends, Dr. Roberts spoke as follows:

"I am glad to be with you this evening and I appreciate your good wishes and greetings.

"I was born in McMinn County, Tennessee, the third son of William S. and Catherine Walker Roberts, December 13, 1850. At the age of 3½ years I came with my family in a covered wagon to Polk County, Missouri. We were six weeks on the road. We located first near Aldrich, Missouri, later moving to a farm northeast of Bolivar where I grew up. I attended school for three months in each year in a log schoolhouse until I was 16 years old and then I attended the Bolivar Academy for about two years. I was then granted a teacher's certificate by the County Superintendent and taught school. While teaching, I studied medicine with the late Dr. J. W. Farmer, a pioneer physician of Bolivar.

"In the fall of 1871, a fellow student and I decided to go to St. Louis and attend lectures. We secured the services of a man with a team and wagon to take us to Springfield which was thirty miles away. It took us all day to make the trip. We boarded a train for St. Louis at 7 o'clock that evening and arrived there at 7 o'clock



DR. J. F. ROBERTS

the next morning. We got off the train at a one story frame depot and walked up Sixth Street. We had breakfast and then went out to look around and heard a newsboy calling 'Morning papers. All about the great Chicago fire.' It was October 8, 1871. We matriculated with Dr. John T. Hodgen, Dean of the St. Louis Medical College, that day and attended college and hospital until the following March.

"I located at Halfway and remained there eight months. Then I went to Lewisville, Texas, not far from Dallas, where I practiced medicine for about four years. In October 1876, I returned to St. Louis and attended the Missouri Medical College from which I was graduated in March 1877. I then returned to Bolivar and opened an office and have practiced here ever since that time. I have been practicing medicine for sixty-seven years, sixty-two in Bolivar.

"For the first eighteen or twenty years I rode horseback, as did all physicians at that time. Later I bought a two wheeled cart, then a one horse buggy and a cozy cab before automobiles came into general use. The trips were hard over rough muddy roads, crossing swollen streams at night, often having to swim when my horse missed the raffle. When we quit riding horseback and using carts and buggies, I bought a Ford car which was not a much better method of traveling as it frequently got stuck in the mud or snow and I had to secure help to get going again. There were no telephones when I commenced to practice; they came into use some ten or fifteen years later. For many years most of the calls for a doctor were made by messengers on horses.

"In our earlier years of practice we had no hypodermics. The first thermometers in 1874 were not self-registering. We had no sphygmometer, stethoscope or any instrument of precision for use in diagnosis as were later invented. We had to depend on tradition and experience handed down from past generations. While in an early day, the practice of medicine and surgery was founded more on theory and experience, the early physicians handled their cases surprisingly well. Surgical operations were less frequent in those days. The physician at that time had to depend on his own intuition, knowledge and experience, and I, as well as all old pioneer doctors, had to treat dislocations and fractures and even perform amputations alone, often in unsanitary surroundings with no light except a coal oil lamp. We had no assistant or nurse and had to administer the anesthetic ourselves. I have had to administer an anesthetic and deliver a child without help when a woman was in convulsions, and am truly thankful that I came through with the woman and child both alive. We could not then step to the telephone, or to the next door, and call an assistant or an ambulance to take the patient to a hospital.

"Appendicitis was called inflammation of the bowels, malaria was considered to be due to miasma or bad air, tuberculosis was thought to be due to inheritance, diphtheria or croup was classed as inflammations not due to an infection, the causes of typhoid were unknown and immunization against it had not been discovered. Immunization against diphtheria, rabies and most contagious diseases was not known or practical. Bacteriology after the discoveries by Pasteur, Koch and others became an exact science. Local anesthesia was unknown when I began to practice medicine.

"We had few or no specialists when I commenced the practice of medicine. There were few hospitals and none in reach of us and trained nurses were very scarce except in the larger hospitals. X-ray, radium, blood transfusions, operators for goiter and gastric and duodenal ulcers, the collapse of the lung in the treatment of tuberculosis, brain surgery and many other surgical operations on internal organs which are now used and practiced were unknown. In fact, they were not considered possible before antiseptic surgery was discovered. We have made great progress in the care and

treatment of the sick and I am glad to have had a part in the work.

"Again thanking you for this gathering in honor of my eighty-ninth birthday, I wish each of you many useful years."

R. E. HARRELL, M.D., Secretary.

#### Lawrence-Stone County Medical Society

The Lawrence-Stone County Medical Society met on January 16.

Dr. G. Wilse Robinson, Sr., Kansas City, spoke on "The Newer Methods of Treatment of the Psychoses," illustrated by motion pictures.

L. M. LYONS, M.D., Secretary.

#### NINTH COUNCILOR DISTRICT

ELDON C. BOHRER, WEST PLAINS, COUNCILOR

##### South Central Counties Medical Society

The South Central Counties Medical Society met in Cabool on November 9 with the following members present: Drs. R. W. Denney, R. A. Ryan, H. G. Frame and A. C. Ames, Mountain Grove; Leslie Randall, Licking; T. E. Ferrell, Mountain View; Garrett S. Hogg, Cabool; J. E. Smith, Rolla; E. H. Rainwater, Springfield; L. M. Dillman, Houston; E. C. Bohrer and E. R. Bohrer, West Plains.

Dr. J. E. Smith, Rolla, spoke on "Trachoma: Diagnosis, Prevention and Treatment."

Dr. E. H. Rainwater, Springfield, discussed "Common Injuries of the Eye and Their Treatment."

These talks were well received and the speakers were extended a vote of thanks.

##### Meeting of December 14

The Society met at Mountain Grove at the Elliot Hotel at 12:30 p. m. Following lunch the meeting adjourned to the Cameo Theatre for the scientific program and business meeting.

Dr. W. Wallis Smith, Springfield, spoke on "The Appendicitis Problem."

Dr. R. Ned White, Springfield, talked on "Differential Diagnoses."

Dr. Durward Hall, Springfield, discussed "Postoperative Treatment of Appendicitis and Its Complications."

These papers were excellent and were well received.

The following officers were elected: President, Dr. R. M. Norman, Ava; vice president, Dr. E. R. Bohrer, West Plains; secretary-treasurer, Dr. C. F. Callihan, Willow Springs; censors, Drs. R. W. Denney and R. A. Ryan, Mountain Grove, and J. A. Fuson, Mansfield; delegates (Howell) Dr. A. H. Thornburgh, West Plains, alternate, Dr. P. D. Gum, West Plains; (Oregon) Dr. F. A. Barnes, Thayer, alternate, Dr. C. W. Cooper, Thayer; (Texas) Dr. Leslie Randall, Licking, alternate, Dr. L. M. Dillman, Houston; (Wright) Dr. H. G. Frame, Mountain Grove, alternate, Dr. R. A. Ryan, Mountain Grove; (Douglas) Dr. R. M. Norman, Ava, alternate, Dr. M. C. Gentry, Ava.

It was decided to hold the next meeting in West Plains on January 11 at 7:00 p. m.

Members present were Drs. R. B. Tilley, Plato; R. A. Ryan, H. G. Frame, A. C. Ames and R. W. Denney, Mountain Grove; L. T. Van Noy, Norwood; J. A. Fuson, Mansfield; E. R. Bohrer and A. H. Thornburgh, West Plains; Garrett S. Hogg, Cabool; C. F. Callihan, Willow Springs; R. M. Norman, Ava; L. M. Dillman and J. R. Womack, Houston; R. Ned White, Durward Hall and W. Wallis Smith, Springfield.

E. R. BOHRER, M.D., Secretary.

##### Meeting of January 11

The South Central Counties Medical Society met at the Arcade Hotel in West Plains at 6:00 p. m., January 11, for a dinner meeting.



Dr. George W. Hogeboom, Springfield, presented a paper on "The Changing Trends in the Surgical Treatment of Gallbladder Disease."

Dr. Francis B. Camp, Springfield, spoke on "Sulfanilamide and Its Derivatives."

Dr. William J. Wills, Springfield, talked on "The Use of Sulfanilamide in the Treatment of Gonorrhea."

Those present were Drs. J. W. Bingham, E. R. Bohrer, A. H. Thornburgh and P. D. Gum, West Plains; R. A. Ryan and A. C. Ames, Mountain Grove; C. F. Callihan, Willow Springs; George B. Hogeboom, Francis B. Camp and William J. Wills, Springfield.

C. F. CALLIHAN, M.D., Secretary.

## TENTH COUNCILOR DISTRICT

E. J. NIENSTEDT, SIKESTON, COUNCILOR

### Cape Girardeau County Medical Society

The Cape Girardeau County Medical Society held a dinner meeting at Cape Girardeau on January 8.

Because of inclement weather the guest speaker was unable to attend.

Those present were Drs. C. T. Herbert, president, J. H. Cochran, D. H. Hope, H. V. Ashley, Glenn Tygett, William Oehler, D. B. Elrod, P. B. Nussbaum, Frank Hall, and C. A. W. Zimmermann, Cape Girardeau; A. M. Estes, D. I. L. Seabaugh and Rusby Seabaugh, Jackson; Edward Crites, Sedgewickville.

A letter from the Association calling attention to the Eli Lilly and Company's long record of advertising in *THE JOURNAL* was read. The secretary was instructed to write an appropriate letter to the company.

A letter from Dr. G. Wilse Robinson, Kansas City, concerning his addressing the Society on "Mental Health" was referred to the program committee.

A communication from Dr. C. E. Gilliland requesting that the Society take some action on the Wagner Bill similar to that taken by the St. Louis County Medical Society was ordered received and filed.

A communication from the Council of the Missouri State Medical Association regarding examination of barbers and announcing that the State Board of Health by resolution designated "any duly licensed physician of the state to carry on said examinations and to report their findings to the State Board of Barbers' Examiners on the prescribed form as approved by the State Board of Health" was received with satisfaction and commendation of the State Board of Health. Dr. J. H. Cochran moved that the local daily newspaper be apprised of this letter and requested to correct an erroneous article on the subject which appeared in a recent issue.

A communication from Dr. E. E. Glenn, chairman of a special Committee on Tuberculosis of the State Association, requesting that a committee on tuberculosis be appointed by the Society was read and approved. Drs. C. A. W. Zimmermann, Rusby Seabaugh and R. A. Ritter were appointed.

Dr. J. H. Cochran reported that a member of the Society was examining food handlers for \$1 and moved that the secretary call this member's attention to an action of the Society at the last meeting by which it was voted that \$3 should be the minimum fee for such examinations. Dr. D. I. L. Seabaugh seconded the motion which carried.

Dr. Rusby Seabaugh reported that he was approached by Dr. E. M. Bryan and told if the medical profession would vaccinate school children for a fee prescribed by the state (50 cents) the state would round up the children and if not the state would do the vaccinating gratis. Dr. Seabaugh's attention was called to a resolution adopted by the Society in 1932 and frequently referred to which bound the Society to vaccinate indigents gratuitously and apply the regular fee to those able to pay.

On motion of Dr. Frank Hall, a committee on public policy to work out a course concerning health matters

for the Cape Girardeau County Medical Society was appointed as follows: Drs. D. I. L. Seabaugh, Frank Hall and D. H. Hope.

Dr. Rusby Seabaugh presented the plan for the "Medical Care for Farm Security Administration Families in St. Charles County, State of Missouri," and stated that the plan was going to be adopted in Cape Girardeau County; that there were 180 families and that the estimated revenue would be \$2,500 a year. After discussion the Society voted to approve the plan and have the members cooperate.

C. A. W. ZIMMERMANN, M.D., Secretary.

## Pemiscot County Medical Society

The Pemiscot County Medical Society met in Caruthersville, December 18.

The following officers were elected: President, Dr. Charles C. Castles, Caruthersville; vice president, Dr. Joseph B. Luten, Caruthersville; secretary-treasurer, Dr. W. R. Limbaugh, Hayti; censor for three years, Dr. P. J. Aquino, Caruthersville; delegate, Dr. Joseph B. Luten, Caruthersville.

W. R. LIMBAUGH, M.D., Secretary.

## St. Francois-Iron-Madison-Washington-Reynolds County Medical Society

The St. Francois-Iron-Madison-Washington-Reynolds County Medical Society met with the editors of the five county newspapers as guests for dinner at the State Hospital, Farmington, December 20 at 6:30 p. m.

Dr. Joseph E. Glenn, St. Louis, spoke on "The Prevention of Renal Damage," illustrated by lantern slides.

Dr. Daniel E. Sexton, St. Louis, discussed "Endocrine Therapy in General Practice," illustrated by lantern slides.

Both papers were discussed and many questions were asked.

Dr. Sexton then spoke on "Public Relations as Pertains to Safeguarding Public Health." The editors, Colonel W. L. Bouchard, Flat River, Mr. Jess Stewart and Mr. John Steinbeck, Bonne Terre, and Mr. Harry Denman, Farmington, discussed the question freely with the members and were sympathetic with the problems and pledged their full support in any matter desired.

G. TIVIS GRAVES, M.D., Secretary.

## Ste. Genevieve County Medical Society

The Ste. Genevieve County Medical Society held its annual meeting at Ste. Genevieve on December 13, with the president, Dr. John A. Wilkens, St. Marys, presiding.

The following officers were elected: President, Dr. Richard C. Lanning; vice president, Dr. George M. Rutledge; secretary-treasurer, Dr. Robert W. Lanning; delegate, Dr. Arthur E. Sexauer, Ste. Genevieve; alternate, Dr. John A. Wilkens, St. Marys; censors, Drs. A. E. Sexauer, C. J. Clapsaddle and R. C. Lanning, Ste. Genevieve.

A cancer committee was appointed as follows: Drs. J. A. Wilkens, St. Marys; C. J. Clapsaddle and Richard C. Lanning, Ste. Genevieve.

R. W. LANNING, M.D., Secretary.

Liniments have little, if any, healing qualities when applied to sprains, although they may relieve the pain, the January issue of *Hygeia, The Health Magazine* states. The best treatment for sprains is complete rest for the injured part.

Liniments are not so important in medical practice as they formerly were. They are still used frequently, however, for sore and stiff muscles and stiff joints, but the main benefit is due to the rubbing. Their effect is due principally to their tendency to evaporate quickly, which causes cooling, moderate irritation and excess of blood.

## WOMAN'S AUXILIARY

### WOMAN'S AUXILIARY TO THE AMERICAN MEDICAL ASSOCIATION

18th Annual Meeting, New York

President, Mrs. Rollo K. Packard, Chicago.

### WOMAN'S AUXILIARY TO THE MISSOURI STATE MEDICAL ASSOCIATION

16th Annual Meeting, Joplin

President, Mrs. Paul F. Cole, Springfield.

President-Elect, Mrs. Stanley P. Howard, Jefferson City.

Adviser, Dr. Herbert L. Mantz, Kansas City.

The first object of the Woman's Auxiliary is "through its members to extend the aims of the medical profession to all organizations which look to the advancement of health education." In these days of confusion and misunderstanding of the medical problems, it is the privilege and duty of the Auxiliary first, intelligently to inform themselves and, second, to provide speakers, trained in the art of presenting their material, to appear on health education programs of lay women's organizations.

To accomplish these two aims the members must familiarize themselves with the following material obtained from and recommended by Dr. R. G. Leland, Director of the Bureau of Medical Economics, American Medical Association: (1) "Economics and Ethics of Medicine." (2) "Is Medicine to Be Socialized?" (3) "The Significance of the National Health Program." (4) "Confidence in Your Physician." (5) "Who Chooses Your Physician?" (6) "Organization of Medical Services." (7) "Health Insurance in England, 1938." (8) "Cooperatives and Medical Services." *Hygeia* can be depended upon always for authentic information on health and should be recommended to the public.

It is not advisable for members of the Auxiliary to speak on problems relating to medical economics or health problems before lay groups. Consult the Advisory Council of the County Medical Society which may be interested in promoting a speakers' bureau or contacting the Association's Committee on Postgraduate Course.

To Public Relations' Chairmen: Are you working on your public relations questionnaire to be returned to the state chairman before March 1? Thanks to those who have sent in their reports.

MRS. E. L. JOHNSTON,  
Public Relations Chairman.

Mrs. A. D. Knabb, Springfield, State Chairman of Archives, plans to make a scrapbook of the yearbooks of the auxiliaries which will be displayed at the Annual Session in Joplin. Later it will be taken to the National Convention in New York. She requests that each auxiliary send her a yearbook even if it is hand written. Callaway County has a clever yearbook made in the shape of a physician's grip and LaFayette County has dedicated its yearbook to Mrs. J. W. Lightner, Odessa, who will be 80 years old in February.

Some splendid public relations meetings are reported in the January number of the *Quarterly Bulletin*. Several others will be held in March with Dr. W. W. Bauer, Chicago, as speaker.

Dr. and Mrs. Paul Cole, Springfield, have returned to Rochester, Minnesota, where he will undergo treatment.

Mrs. Walter C. G. Kirchner, St. Louis, a past president of the Auxiliary, will have an exhibit of her paintings in January.

Mrs. Rolla K. Packard and the National Committee on Public Relations asks that "all members belonging to lay women's organizations be urged to oppose endorsement of or opposition to health legislation until time be taken for study of the actual proposals and their effects."

## BOOKS FOR LEISURE MOMENTS

### DEPTH-PSYCHOLOGY

There is much that is good and much that is missing in "Practical Child Psychotherapy" (John Bale, London) by Dr. Curt Boenheim, Sometime Director of the Clinic for Nervous and Difficult Children at the Kaiser and Kaiserin Friederich Kinderkrankenhaus in Berlin. For the skilled child psychiatrist this little volume is too elementary. For the general practitioner who would add to his understanding, the general handling of the child is too vaguely presented, the technic of depth-psychology too little elucidated.

Yet there is need for books of this type. This is evident from the statistical fact that between 5 and 6 per cent of our children will spend some portion of their lives in an institution for the mentally diseased. The professional psychiatrists give assurance that breakdown usually arises from the lack of training, over-training or improper training in childhood. There can be no question that children need to be handled with diplomacy more than they need to be treated with medicine. Or, as Boenheim states, their parents have to be treated in order that the children may avoid treatment. For example, "In every instance (of loss of appetite) exact differential diagnosis must first be made . . . whether a nervous condition in the child or a state of anxiety in the parents is the dominant factor. . . . Just as restlessness and anxiety on the part of parents affects the child, in the same way nervous children who are 'difficult' with their food introduce an element of restlessness into the home. . . . A vicious circle is set up."

No physician who has cared for children can doubt that the child becomes the "uncrowned king of the castle." But I am not sure that from this volume the physician will discover the road to abdication nor is he likely to find sufficient information to enable him to prevent the usurpation of the pretender. B. Y. G.

### BREATHING LIFE INTO NUTRITION

Research increasingly reveals the glaring inadequacies of the average American diet. Yet no serviceable method of imparting knowledge of those inadequacies to the public at large has been disclosed. Until the public understands the need for and practices the consumption of a proper diet the value of nutritional research will not have been realized. It must be admitted that there is no method by which this information may be brought to the attention of the mass of the present adults. Therefore, a beginning must be made with the pupil in the school in the hope that he will carry into his home pertinent nutritional information.

As nutrition is ordinarily taught in the high school it forms an inconsequential part of the course in physiology. The method of presentation is not likely to arouse the consciousness of the pupil and the whole subject matter is sure to be forgotten even before the ink of the diploma has dried. For that reason "Teaching Nutrition in Biology Classes: An Experimental Investigation of High School Biology Pupils in Their Study of the Rela-



tion of Food to Physical Well-Being" (Columbia University Press, New York) by N. Eldred Bingham offers a refreshing approach to a subject whose importance can not be denied but whose subject matter is too often dully stereotyped.

Bingham investigated the dietary knowledge of groups of students. He introduced the experimental methods of the research scientist to the class room. He taught students to build an ice calorimeter for the measurement of the heat given off by small animals. He taught them to build a respiration calorimeter to measure their own oxygen consumption, both at rest and at work. He permitted them to care for rats and mice on inadequate diets and to observe the development of deficiency diseases. Through this process of visual education he permitted students to draw their own conclusions as to the place and importance of the dietary constituents. It is to be hoped that the methods elaborated by Bingham will be widely copied, that every high school student may achieve a thorough understanding of the role of a good diet in promoting health.

B. Y. G.

#### THE EASE IN SPEED

"Training for Championship Athletics" (Whittlesey House, New York) by Dr. C. Ward Crampton is a compilation by a physician who has been athlete, coach, sports director and physician to athletes.

The volume is divided into two parts, the first a resume of the sports field, the second, a meticulous description of the regime for the would-be champion. Dr. Crampton possesses a fluid literary style which is calculated to hold the interest of boys of high school age and even the aspiring collegian.

The Crampton test of physical efficiency is much simpler than the tests usually described for the detection of cardiac insufficiency. The pulse rates are determined with the patient prone and standing. If the rates are the same, or approximately the same, the heart is in good condition to stand the strain of competition. Crampton writes that blood pressure measurements in the prone and standing positions indicate the functional capacity of the venous return system. A blood pressure appreciably higher in the latter position indicates poor venous return and circulatory insufficiency.

Every coach having charge of a group of sports minded boys or girls would do well to become acquainted with this book. Through it he may learn how to keep the adolescent fit and when not to force his participation in an athletic program ill adapted to his immature physical status.

B. Y. G.

#### MORE ON A TIMELY SUBJECT

Propaganda determines the basis of social attitudes. It is disseminated through every medium of public communication. In books the inherent bias of the writer operates so insidiously that the reviewer has a difficult task to separate truth from apparent veracity. This is particularly the case in "The Health Insurance Doctor" (Princeton University Press) by Barbara N. Armstrong, one of the few women to hold a professorship of law. She looks upon the law as an instrument for public welfare. She has been active in the fight for social security and played an important part in shaping the present Social Security Act. For two decades she has campaigned vigorously for health insurance in her native state, California. The book is a scholarly compilation of data on the practice of health insurance in England, Denmark and France.

The French government inaugurated health insurance in 1928, the act applying only to employed persons having a certain maximum income. It is poorly conceived and badly executed. There has been and is rather marked friction between the medical association

and the government. This in itself is sufficient to impair the usefulness of the act. On at least one occasion the association has coerced the government into modifying a decree concerning conditions of practice. Nor has the association cooperated with the government in determining fees. The result is that the insured Frenchman who seeks medical services contributes approximately four fifths of the cost from his own pocket. The health insurance act provides only that he be reimbursed for a portion (approximately one fifth) of his medical expenses. It would appear that in some instances the association has caused fees to be raised in such a manner that the patient would actually secure service at a lower cost if he did not belong to the association.

On the other hand, certain groups of doctors have combined to form clinics in which treatment may be obtained by persons holding governmental insurance within the limits of the reimbursement accorded them. The establishment of such clinics has added fuel to the opposition of the medical association. There has been violent resistance throughout the country to the health insurance act as now administered. In extenuation of the present difficulties it may be stated that France has the youngest act of any of the countries considered in the present volume.

A series of modifying laws have extended the concept of health insurance in England since 1912. At the present time there appears to be widespread satisfaction with these laws as indicated by the approval of the medical societies and the clamor for the inclusion of specialist services as well as the extension of the plan to encompass the dependents of the employed. Mrs. Armstrong points out that there is great enthusiasm among English physicians for the health insurance plan. It is administered by local committees which distribute fees as well as disability benefits. The panel physician is paid according to the number of potential patients who belong to his panel, the distribution of funds being on a quarterly basis.

The burden of health insurance practice in England does not appear onerous to the practitioner nor displeasing to the patient according to opinion based upon inquiry among physicians and patients. It is of little statistical value but the author does adduce statistics to prove her point. Charges may be brought against the physician for alleged negligence yet the number of such charges varies between six and twenty-two annually, an insignificant incidence in view of the 14,930 practitioners offering such service to fifteen and a half million persons. This is certainly much less than the number of malpractice suits brought in this country. Also, patients rarely change physicians.

Denmark began health insurance in 1892. Worker and dependents are included. Payment of physicians is on a capitation basis including the services of specialists. The chief disaffection for the scheme is in Copenhagen because only part of the physicians there resident are entitled to employment on the panel. It is claimed that the conditions of residence in the capital city are so delightful that if it were not for this restriction the rural areas would be left without medical services. Through the establishment of rural medical centers, however, the government is attempting to make the conditions of rural practice attractive to specialists in order that the benefits of modern medicine may be available to all of her people.

Since Denmark has practiced health insurance for the longest period of time it is to be expected that general satisfaction with the scheme is greater in that country than in either of the others considered in the volume. Indeed, the author is at pains to point out that even in England it is only within recent years that there has been widespread satisfaction among physicians. She makes it clear that original law is not perfect and that only time and a willingness to iron out differences will achieve a degree of happiness on the

part of all concerned. The French system is too newly inaugurated to be worthy of serious consideration. There appears to have been, as yet, no meeting of the minds of the government and the medical association there.

Mrs. Armstrong provides exact statistics on the compensation earned by the general practitioner in England and Denmark under health insurance though she cannot estimate the income derived from noninsurance practice. While she delineates the limits of earnings her comparisons of relative earnings are much more illuminating. In England the average physician's income from health insurance services is approximately three times the maximum earnings of the skilled engineer, four times those of the engineering laborer and more than five times that of the agricultural laborer. In Copenhagen the average physician earned from health insurance practice 2.7 times the full time annual wage of the skilled worker and four times the maximum wage of the unskilled worker. These figures may be compared to those recently circulated by an eastern medical society which tend to show that the average American physician earns less than the skilled artisan.

While Mrs. Armstrong's antecedents indicate a considerable bias in favor of health insurance she has tried to give a dispassionate consideration of the problem. In view of the present unsettled situation in America in regard to health insurance perusal of the volume is certain to be of interest to the American physician.

B. Y. G.

## BOOK REVIEWS

**CARDIOVASCULAR DISEASES. Their Diagnosis and Treatment.** By David Scherf, M.D., Linn J. Boyd, M.D., F.A.C.P., Associate Professor of Clinical Medicine and Professor of Medicine, respectively, The New York Medical College, Flower and Fifth Avenue Hospitals. St. Louis: The C. V. Mosby Company. Price \$6.25.

This is a text written with the sole purpose of producing a treatise that is concise, factual and not so lengthy and complicated but that it is easily readable and a good reference for the practicing physician. This is not a book that includes a lot of theoretical material not proven by clinical trial; the subject matter is up-to-date and applicable to every day practice. I think this is a good, practical text to own.

R. S. C.

**HEART PATIENTS, THEIR STUDY AND CARE.** By S. Calvin Smith, M.S., Sc.D., Formerly special heart examiner for the Surgeon General's Office during the World War at home and abroad; Author of "Heart Affections: Their Recognition and Treatment," etc. Philadelphia: Lea & Febiger. 1939. Price \$2.00.

In this small volume the author has successfully presented a discussion of the heart patient rather than a highly technical description of heart disease. Each chapter is exceedingly practical and concise. Beginning with such a simple procedure as history taking of the heart patient he continues the discussion through the physical and laboratory examinations and concludes with practical advice on the selection of nurses for those patients suffering from heart disease. The chapter on the bedside recognition of cardiac irregularities is excellent.

Throughout the book the author repeatedly emphasizes one of his cardiac aphorisms, "The muscle is of more importance than the murmur; the rhythm is of more importance than the rate."

The physician engaged in general practice will find this book valuable for ready reference.

R. V. P.

**A TEXTBOOK OF SURGERY.** By American Authors. Edited by Frederick Christopher, B.S., M.D., F.A.C.S., Associate Professor of Surgery at Northwestern University Medical School; Chief Surgeon, Evanston (Illinois) Hospital. With 1381 illustrations on 752 figures. Second edition, revised. Philadelphia and London: W. B. Saunders Company. 1939. Price \$10.00.

The popularity of this book is attested by the appearance of a second edition within three years.

The second edition has been extensively revised in keeping with the advances of surgical practice. Notably, since 1936, sulfanilamide and the use of a pin or nail as the choice treatment in fractures of the femoral neck have been widely introduced.

All of the good qualities of the first edition are still present. This edition is highly recommended to every student or practitioner who has any interest in surgery.

B. S. P.

**NUTRITION AND DIET IN HEALTH AND DISEASE.** By James S. McLester, M.D., Professor of Medicine, University of Alabama, Birmingham, Alabama. Third edition, entirely rewritten. Philadelphia and London: W. B. Saunders Company. 1939. Price \$8.00.

In a volume of over 800 pages McLester has gathered the latest information on the role of diet. It is of particular interest that he has devoted over 300 pages to the consideration of the factors composing the normal diet, only 400 pages to the use of diet in disease. He thereby emphasizes a concept, rapidly finding favor, that diet may be just as useful in the prevention of disease as in its treatment. The general practitioner need not be awed by the minutiae of the book. He may skip through the scientific detail to find menus which he may copy for his patients.

B. Y. G.

**EYE, EAR, NOSE AND THROAT MANUAL FOR NURSES.** By Roy H. Parkinson, M.D., F.A.C.S., Head Oculist and Aurist to St. Joseph's Hospital, San Francisco, California. Fourth edition. St. Louis: The C. V. Mosby Company. 1939.

This book should prove invaluable in the instruction of nurses as well as being informative for medical students, interns, resident physicians, general practitioners and specialists. That technical terms are used infrequently and where used are immediately explained in parenthesis is gratifying.

The following is an example of how adequately the subject matter is handled: "Bacteria passing down the throat in food or water must necessarily come in contact with the free surface of the tonsil and work their way down into the crypts. As the bacteria grow they throw off their waste products or toxins, which are absorbed by the blood stream and carried to all cells of the body which react by developing protective substances called antibodies. In some cases, drainage from the crypts is so meager that the germs may overwhelm the body with poisons, or possibly the actual entrance of bacteria into the blood stream may take place. If the mouths of crypts are freely open so that the drainage out of them is not hindered, absorption into the body is not excessive, and in early life the tonsils play a real part in developing our resistance against ordinary disease germs."

The portion dealing with nasal anatomy is highly simplified and pleasingly instructive.

The few lines devoted to treatment under each condition could have been omitted for the most part as there are so many differences of opinion. Most modern is the mention of sulfanilamide in the treatment of coccal eye, ear, sinus and throat acute infections, but modern also might have been the consideration of S. N. Parkinson's lateral head low posture in treatment of the nose and sinuses using ephedrine in a physiological vehicle.



The reference to allergic states is conspicuous by its absence. Likewise nasal polyps are apparently placed upon an entirely infectious basis. Suffice to say, Semenov, who studied a thousand sections from several hundred surgical specimens during the last ten years, came to the conclusion that allergy is a predisposing factor in nearly half of the cases of sinusitis and that the majority of obviously allergic cases presented superimposed suppurating infection. However, perhaps it was the author's purpose not to bring in this confusing subject of allergy.

The considerations of the larynx, ear, eye, operating room technic, postoperative care and problems met by public health nurses are illuminating L. C. B.

**UROLOGY.** By Daniel N. Eisendrath, M.D., Consulting Urologist to the American Hospital, Paris, France; and Harry C. Rolnick, M.D., Attending Urologist, Michael Reese, Mt. Sinai, and Cook County Hospitals, Chicago. Seven hundred and fifty black and white illustrations and twelve in color. Fourth edition, entirely revised and reset. Philadelphia: J. B. Lippincott Company. 1938.

This revised edition of this practical textbook should increase its popularity with medical students and general practitioners. The subjects are arranged ideally and discussed concisely and clearly. The subject of gonorrhea has been rewritten but fully covered. The chapter on neurogenic dysfunction of the bladder will lead to controversy by students of this subject but, nevertheless, it gives a satisfactory basic outline of neurogenic problems. The separate chapters on urology in the female and in children are adequately presented.

The aim of the authors to simplify the subject of urology for leading purposes has certainly been accomplished. Personal experiences throughout the book with many useful practical suggestions will make it a valuable reference work for both the general practitioner and the urologist. H. C.

**WORTH'S SQUINT OR THE BINOCULAR REFLEXES AND THE TREATMENT OF STRABISMUS.** By F. Bernard Chavasse, M.A., D.M. (Oxon), Surgeon Eye Department, Liverpool Eye and Ear Infirmary, Lecturer in Ophthalmology, University of Liverpool. Seventh edition. Philadelphia: P. Blakiston's Son & Co., Inc. 1939. Price \$8.00.

According to the title page this is the seventh edition of "Worth's Squint," but according to the preface it is a new book with new material and new conceptions, written in the hope that it may take the place occupied for thirty years by Worth's classic. The greater part of the book is devoted to the physiology of the binocular function, the development of normal and abnormal binocular reflexes and the diagnosis of these conditions. All varieties of squint are regarded as perversions of the binocular reflexes. The secondary retinal correspondences brought about by deviation tend to become more fixed and dominant through the influence of time and usage and to develop a "pseudo-macula" difficult to correct. Alternating squint is primarily due to congenital abducens palsy, such a miracle as "congenital defect of the fusion faculty" must not be presumed until natural causes have been excluded. Early correction of the deviation makes stereopsis possible by bringing the two foveae into simultaneous use. Prognosis as to function depends most on the proportion of life during which the squint has existed before the beginning of energetic treatment; every day's delay militates against the result.

Orthoptic training, necessarily intermittent, is useless, even harmful. The use of any form of stereoscope is apparently useful only in cases of squint which are not constant and which are more effectively treated by

methods which act constantly, e. g., operation and glasses; some of these cases result in cure with no treatment at all. The stereoscope is useful only in diagnosis. Duction training with exercises and prisms is dismissed as being temporizing and having decided limitations, "in fact with disadvantages and dangers."

The first step in treatment is constant occlusion of the straight eye until the visual acuity of the squinting eye is made equal to that of the other, or nearly equal, and the squint then made alternating. When this is achieved operation is indicated to bring the two foveae into simultaneous use. Early operation, in early infancy, is advised, after definite and accurate diagnosis and after achievement of equal vision and alternation. The author seems to think this possible even in early infancy. This is of course not applicable in cases of incurable monocular amblyopia; then only cosmetic and psychologic results can be attained.

This is an extensive and detailed exposition of the author's conceptions of the physiology and development of squint and the principles of treatment which they indicate. Studious perusal of this book would help greatly toward understanding the complicated "kaleidoscopic panorama of strabismus." R. J. C.

**DIAGNOSIS AND MANAGEMENT OF DISEASES OF THE BILIARY TRACT.** By R. Franklin Carter, B.S., M.D., F.A.C.S., Associate Clinical Professor of Surgery, New York Post-Graduate Medical School, Columbia University, New York; Carl H. Greene, A.B., Ph.D., M.D., F.A.C.P., Associate Clinical Professor of Medicine, New York Post-Graduate Medical School, Columbia University, New York, and John Russell Twiss, A.B., M.D., F.A.C.P., Assistant Clinical Professor of Medicine, New York Post-Graduate Medical School, Columbia University, New York. Illustrated with eighty-four engravings and six plates. Philadelphia: Lea & Febiger. 1939. Price \$6.50.

To fairly evaluate a medical book, a conscientious reviewer will not strive merely to merit an author's copy nor judge it by its appeal to his own requirements but will estimate its value from the standpoint of the author's intent; its individual value to the student, practitioner and specialist, and its scientific worth.

One is primarily attracted by the fact that the subject is treated by specialists in surgery and medicine in collaboration with the roentgenologist, biochemist, physiologist, anatomist and dietitian, all of whom have separate and important functions in the study of biliary disease, and that this study and the conclusions have been made possible through the inestimable advantages of a separate clinic and active contact with nearly 4,000 cases of biliary disease. In addition, the opinions of others have not been ignored and conclusions of many authors are repeatedly cited. It has taken many years of error and selfish egoism for the profession finally to realize that human ills are not to be tabulated, treated and pigeon-holed as strictly medical or surgical, and the most sincere commendation of this book rests upon the fact that every branch of the science has a voice in their study. With some of their conclusions and recommendations, one's experience may urge slight disagreement, but on the whole the subject has received critical study and their efforts have resulted in a monograph of real value to all interested in the intricacies of biliary tract disease and treatment. For the student, this work should be most helpful as it first establishes an anatomic and physiologic foundation upon which a conception of pathology, disease and remedy may be based. For the internist and surgeon, it is useful in that both must be impressed by the need of constant cooperation in the care of biliary disease. The basic knowledge should stimulate one to respect the import of the biliary tract to the human economy, as well as to endeavor to circumvent biliary disease by timely preventive therapy,

early diagnosis and treatment before irreparable damage has been inflicted.

Part I deals with etiological factors, part II discusses diagnosis, Part III the medical treatment, Part IV the surgical management and Part V reviews the results of treatment and discusses contiguous and systemic complications. The authors stress the value of each patient being treated as an individual, avoiding dogmatic routine and its multiple dangers. While deductions may safely be arrived at by gross material and broad experience, error will creep in if individual characteristics and physiological status are ignored. The book is not intended as a guide in the various surgical technics. From the surgeon's standpoint it ignores operative detail, both pictorial and descriptive, but it does contain about all a surgeon should know on the true physiology of the biliary tract and the details of preoperative and postoperative management. To the surgeon, as well as to the internist, the reviewer is in entire agreement with the final conclusions, "Diagnosis and Management of Diseases of the Biliary Tract," is well worthy of a place on the reference table.

F. W. B.

**PRINCIPLES OF CHEMISTRY.** An Introductory Textbook of Inorganic, Organic, and Physiological Chemistry for Nurses and Students of Home Economics and Applied Chemistry. With Laboratory Experiments. By Joseph H. Roe, Ph.D., Professor of Biochemistry, School of Medicine, George Washington University; Formerly Instructor in Chemistry, Central School of Nursing, Washington, D. C. Fifth edition. St. Louis: The C. V. Mosby Company. 1939. Price \$3.00.

The book is ably described by its subtitle "An Introductory Textbook of Inorganic, Organic and Physiological Chemistry for Nurses and Students of Home Economics and Applied Chemistry." The book covers the course in chemistry for nurses in the Curriculum Guide for Schools of Nursing issued by the National League of Nursing Education in 1937.

This fifth edition follows the original plan of the book which had as objectives to present the fundamental principles of inorganic chemistry, to present selected phases of organic chemistry, to present selected facts and principles of physiological and clinical chemistry, to offer a series of laboratory experiments designed to supplement the theoretical work presented and to give the student training in laboratory technics.

The practical application of chemistry to nursing is stressed including the interpretation of normal living processes, the development of understanding of diseased conditions and a rational basis for therapeutic procedures.

Considerable revision has been made in this edition to include recent discoveries and new interpretations and values of former procedures. The book amply serves its purpose.

**FORENSIC MEDICINE.** By Sydney Smith, M.D., (Edin.), F.R.C.P. (Edin.), D.P.H., Regius Professor of Forensic Medicine, University of Edinburgh, etc. Including a section on American Medico-Legal Procedure by Alan R. Moritz, B.Sc., M.A., M.D., Professor of Legal Medicine, Harvard University School of Medicine. Sixth edition. 169 illustrations. Boston: Little, Brown and Company. 1939.

As stated in the preface to the first edition this book of 650 pages is designed as a concise manual for practitioners and students. Sooner or later every general practitioner is called into court and while their medical knowledge may be sound, their lack of medicolegal knowledge is usually appalling. A book of this type, therefore, is a necessity for every practitioner's library.

Although written from the viewpoint of British jurisprudence, the main topics discussed are universal.

These include time of death, consideration of wounds, firearm projectiles, medicolegal blood examinations (including detection of alcohol in the blood), simulated assaults, rape, abortion, investigation of drowning and strangulation, fractures, insanity, malingering, etc. More than 150 pages are devoted to toxicology.

A special preface to the American edition on legal medicine in the United States is written by Alan R. Moritz, Professor of Legal Medicine, Harvard Medical School. The book is profusely illustrated but the reproductions are not up to the usual standard of our modern textbooks. Some of the cuts could well be omitted. The book is well written, well printed and well indexed so that information sought can be quickly obtained.

R. L. T.

**A SYNOPSIS OF THE DIAGNOSIS OF THE ACUTE SURGICAL DISEASES OF THE ABDOMEN.** By John A. Hardy, B.Sc., M.D., F.A.C.S., El Paso, Texas. With ninety-two illustrations. St. Louis: The C. V. Mosby Company. 1938. Price \$4.50.

The title of this book is confusing because it is more than a synopsis. If it were in large type these 345 pages would make a large volume. There are 92 illustrations.

There are forty-one chapters dealing with history and physical and surface examination of the patient and thirty-seven chapters take up in order every acute abdominal condition. Each chapter is further subdivided into etiology, history, laboratory aids, physical examination, signs and symptoms, diagnosis and differential diagnosis.

Many of the chapters are very complete, i. e., on acute appendicitis fourteen named signs are given for the diagnosis.

There are four chapters which do not deal with acute abdominal conditions, namely, chronic cholecystitis, carcinoma of rectum, imperforate anus and tuberculous peritonitis.

The book is well written and will give the reader a working background for arriving at a correct diagnosis. It emphasizes that one sign or symptom does not make a diagnosis and all available methods should be exhausted until a definite diagnosis is made.

H. P. T.

**A TEXTBOOK OF BACTERIOLOGY.** The Application of Bacteriology and Immunology to the Etiology, Diagnosis, Specific Therapy and Prevention of Infectious Diseases for Students and Practitioners of Medicine and Public Health. By Hans Zinsser, M.D., Professor of Bacteriology and Immunology, Harvard University Medical School, etc., and Stanhope Bayne-Jones, M.D., Professor of Bacteriology, and Dean, Yale University School of Medicine, New Haven, Connecticut. Eighth edition, revised and reset. New York, London: D. Appleton-Century Company, Inc. 1939. Price \$8.00.

This is the eighth edition of a book that for nearly thirty years has been a standard text on bacteriology. This edition is completely revised and reset. A book that has endured through all the changes of our most progressive sciences of medicine for this period of time does not need the gilding of a reviewer. It is only necessary to state some of the new features of this volume. These include studies of our new types and varieties of organisms, studies of bacterial metabolism, purification of toxins, improvement in the service treatment of pneumonia, serological grouping of streptococci, investigation of the rickettsiae, ultra microscopic viruses, chemical studies, bacterial chemotherapy, improvements in technic and new procedures.

In short, there seems to be nothing lacking in this new volume that a student, public health officer, or a physician interested in the fundamentals or practical aspect of bacteriology needs to guide him.

R. L. T.



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### THE DIAGNOSIS AND TREATMENT OF CORONARY THROMBOSIS

FRED M. SMITH, M.D.

IOWA CITY, IA.

Coronary thrombosis, even though a large vessel is involved, produces one of the most varied pictures in clinical medicine. It may be relatively silent and therefore not suspected or, on the other hand, cause sudden death or the most violent symptoms with a wide range of expressions. Therefore, despite the increased interest in this condition, it is not surprising that many cases are still overlooked or confused with other disorders.

The remarkable variation in the severity and distribution of the pain is perhaps most often responsible for the errors in diagnosis. In the first place, the profession has been greatly impressed by the intensity of the pain and, consequently, the possibility of coronary thrombosis is perhaps foremost in mind when distress of this general character appears in the chest from other causes such as syphilitic aortitis, dissecting aneurysm, rupture of the aorta, pulmonary embolus, acute pneumothorax and possible massive collapse of the lung. Moreover, the fact that the pain may be no more severe than that commonly experienced with angina pectoris is still not generally appreciated. Attacks of mild nature not infrequently precede the onset of more severe symptoms by hours or even days as illustrated by the following case.<sup>1,2</sup>

#### REPORT OF CASES

Case 1. A man, aged 60 years, had a feeling of constriction in his chest while showing a friend about his place of business. This was not severe and lasted only a few minutes. The following day he had the same discomfort under similar circumstances. Thirty-six hours later he was awakened at 12:30 in the morning by intense pain in his chest which lasted for about one and one half hours. I saw him two days later. He had driven one hundred miles and was on his way to attend a banquet. There was then unmistakable evidence of acute myocardial damage and therefore the patient was

admitted to the hospital and retained in bed until we felt that it was safe for him to return home.

In the differentiation between angina pectoris and coronary thrombosis the circumstances under which the pain occurs always should be taken into consideration. Pain of this character is more significant when it occurs for the first time or appears while the subject is at rest. The close relationship of these disorders, both as to the basic pathological condition and the mechanism of the pain and the fact that the former is frequently precipitated by the latter, should be borne in mind. In those with angina of effort attacks more severe than usual and especially if they appear while the subject is at rest may be caused by coronary thrombosis.

Case 2. A patient now under observation was admitted to the hospital because of bladder obstruction from hypertrophy of the prostate. This man gave a history of having had angina pectoris of effort for eight years but during the last year the attacks have been much less frequent and not so severe. Following admission to the hospital, however, there were a few days during which he experienced frequent attacks while in bed. The bladder spasms may have been the precipitating factor. However, during this period, alterations occurred in the electrocardiogram indicative of changes in the myocardium.

In this connection it is well to bear in mind that coronary thrombosis not infrequently develops following an operation or for that matter following any condition which requires bed rest. Of 625 cases of coronary thrombosis observed by Master, Dack, and Jaffe<sup>3</sup> thirty-five occurred following operations and thirteen additional cases were suspected but not included because of the lack of necropsy and electrocardiographic confirmation. In the proved cases pain was usually absent or slight, the symptoms more often being dyspnea, cyanosis and shock.

Finally, as pointed out, there are instances in which there is little or no pain. In certain of these cases the initial manifestation is paroxysmal dyspnea. The incidence of this type of onset is probably much greater than is generally appreciated. The rapid development of cardiac failure in the person of the arteriosclerotic age should always direct attention to the possibility of a coronary accident.

Atypical distribution of pain, particularly the

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From the Department of Internal Medicine, State University of Iowa, Iowa City, Iowa.

involvement of the epigastrium, is often responsible for diagnostic difficulties. Occasionally the distress is limited to this region, as in the following case:

Case 3. A man, aged 50 years, was admitted to the hospital because of dyspnea, cough and fever. He was so ill at the time that it was not possible to obtain a satisfactory history. Because of the presence of fine moist rales in the base of the right lung and blood tinged sputum a tentative diagnosis of bronchial pneumonia was made. This was also the roentgenological diagnosis from a film taken of the chest the following morning. It was apparent from the first examination that there was cardiac damage. Moreover, the electrocardiogram showed conspicuous alterations. These changed from day to day and were of the character usually observed in coronary thrombosis. In addition to this there was a definite progression of the cardiac disability during the first thirty-six hours in the hospital as manifested by periods of intense dyspnea, the appearance of gallop rhythm, premature beats and finally paroxysms of auricular fibrillation. After the patient had recovered to a point when a reliable history might be obtained it was found that he was suddenly taken ill with intense pain in the epigastrium accompanied by nausea about 10 o'clock in the evening a few days prior to admission to the hospital following a heavy meal of steak and onions. After about one and one half hours he vomited profusely and had a copious watery bowel movement following which the pain disappeared.

The diagnosis is further complicated by the fact that in conditions of the upper abdomen such as perforating peptic ulcer, acute pancreatitis and particularly gallbladder disease the pain may extend to the chest. This feature was especially impressed on me by a patient studied in 1931.

Case 4. A man, aged 75 years, had had recurring attacks of indigestion consisting of a feeling of fullness in the epigastrium accompanied by consciousness of gas for many years. Five weeks before coming to the hospital he was awakened at 2 o'clock in the morning by severe pain across the anterior chest extending from the middle of the sternum to the episternal notch and laterally to the anterior axillary line on each side. The pain persisted for several days and many hypodermic injections of morphine were required for relief. The attending physician thought the patient had gallbladder disease but there was never any pain in the abdomen and moreover he was not able to elicit tenderness in this location. Later, jaundice appeared and was intense at the time that I first saw him. There was no demonstrable evidence of coronary thrombosis. This case later came to necropsy. The gallbladder was filled with stones and several had passed into the common duct.

Finally, peptic ulcer, gallbladder disease or pancreatitis are not infrequently associated with coronary artery disease.

Case 5. An obese man, aged 58 years, had had occasional heart burn and belching of gas off and on for twenty-five years. Three weeks before I saw him, he contracted an upper respiratory infection and was advised by his family physician to force fluids. Two days later, after having taken large quantities of water and fruit juices, he experienced tight bursting-like pain in the epigastrium, lasting about thirty minutes. The pain was so severe, he stated, that it affected his breathing. Attacks of varying intensity continued to recur until after admission to the hospital. Upon admission it was

discovered that there was slight icteric discoloration of the sclera. The van den Bergh test made on the following day showed the bilirubin level of the blood to be 3.1 mg. per cent. The results from physical examination of heart were negative except for distant and poorly differentiated cardiac tones. The blood pressure was 140 systolic and 100 diastolic mm. Hg. There was tenderness in the epigastrium and right upper quadrant of the abdomen but no mass was felt. The gallbladder was not visualized in the roentgenological examination. Certain of the stools were quite bulky and chemical examination disclosed the fat content to be increased and the enzymes reduced. Six electrocardiograms were taken during a period of ten days and rather striking alterations were observed. In the first curve the T wave was sharply negative in Lead I and with prominently upright deflection in Lead III, whereas in the last one taken the situation was reversed in that the T wave was a positive phase in Lead I and negative in Lead III.

The build of this patient, the history of indigestion, the presence of jaundice, the results of the roentgenological examination of the gallbladder and the findings from the chemical determination of the fat and enzyme content of the stools pointed to the possibility of gallbladder disease with perhaps pancreatitis. The changes in the electrocardiogram, on the other hand, were highly suggestive of myocardial damage. Another man, aged 57 years, in the hospital at the same time, had duodenal ulcer and coronary thrombosis.

There are other features which may lead one astray in the diagnosis. In certain instances the onset is with dizziness or faintness which under rare circumstances may progress to coma. Auricular fibrillation, flutter or ventricular tachycardia may be early features. Occasionally embolic phenomena are the first intimation of coronary accident.

A careful detailed history taking into consideration age, sex and all circumstances leading up to the episode under consideration is unquestionably the best safeguard against overlooking coronary thrombosis or mistaking it for some other condition. In my own experience the failure to obtain some important bit of information from the history usually has been responsible for the error in diagnosis. In the doubtful cases one should bear in mind the various possibilities but not come to a final conclusion until there is sufficient data to justify it. Oftentimes the final decision in cases of coronary thrombosis is dependent upon the demonstration of acute changes in the myocardium. Of the various physical signs the alteration in the cardiac tones resulting in a reduction in intensity and poor differentiation is the most common and the first to appear. However, one should not place too much reliance on this alone but be on the alert for further developments such as gallop rhythm, premature beats and other forms of arrhythmia, pericardial rub, systolic apical murmur and perhaps the extension of the area of cardiac dullness. The electrocardiogram not infrequently provides the only means of detecting cardiac damage and thus may establish the diagnosis. It is extremely important, however, that a curve be taken early



and repeated at one or two day intervals; otherwise significant alterations may be overlooked.

#### TREATMENT

The outcome in coronary thrombosis is always in doubt. Even though the progress may appear to be satisfactory during the first few days there is ever the possibility of complications such as extension of the infarct, the development of a new one, embolic manifestations,<sup>4</sup> or perhaps the rupture of the left ventricle with hemorrhage into the pericardial sac. The patient, therefore, should be confined to bed at as nearly absolute rest as possible and maintained in this state until the period of emergency has passed. Protection of the heart at this time may not only determine the immediate outcome but have a deciding influence on the subsequent course. Morphine is the most valuable remedy during this period of treatment and should be administered in sufficient amounts to control the pain and induce sleep. After the pain has disappeared, unless there is dyspnea, a simple sedative such as phenobarbital is usually effective in promoting relaxation and sleep. Oxygen is indicated in the presence of dyspnea and cyanosis and the patients often comment on the relief obtained by this measure. The intravenous administration of theophylline ethylenediamine (0.48 gram) in 50 per cent glucose solution in amounts of from 50 to 100 cc. commonly has a pronounced effect on the dyspnea and frequently has a beneficial action on the pain.<sup>5</sup> This should be injected slowly and may be employed two or three times during twenty-four hours if the circumstances justify it. Cases have been observed in which in our opinion this medication was a life-saving measure.

There seems to be considerable doubt regarding the use of digitalis and I am inclined to believe that there are perhaps many cases in which the drug is unjustifiably withheld. It should always be prescribed when there is significant cardiac embarrassment as evidenced by dyspnea and cyanosis. When rapid action is desired, a preparation for intravenous use may be added to the theophylline ethylenediamine and dextrose solution. Thereafter digitalis may be given orally either in the form of the powdered leaf, grains  $1\frac{1}{2}$ , or tincture minims 15, three or four times a day. Large amounts are rarely necessary or advisable. Cardiac failure not infrequently follows the temporary recovery from coronary thrombosis and oftentimes it is possible to restore the function by relaxation and sleep and the administration of digitalis. The presence of auricular fibrillation is also an indication for digitalis therapy for if the condition is not abolished or the rate controlled cardiac failure usually develops.

It is highly important that the patient be spared all unnecessary physical effort during the first ten days or two weeks. Thus, the bowels should be regulated by measures that will not produce frequent movements or entail undue strain in passing the

stool. The diet should be simple and of a character not calculated to promote abdominal distention.

The duration of bed rest is determined by the circumstances. A period of from four to six weeks is ordinarily advised. It is questionable if much less than four weeks is justified and there are many patients for whom a longer period may be necessary for the maximum restoration of the cardiac function. This feature of the treatment, therefore, is largely a matter of judgment, taking into consideration the extent of the myocardial damage as evidenced by the changes in the physical findings and the alterations in the electrocardiogram. In many the electrocardiogram shows consecutive alterations for weeks or months and many never return to the original form. So long as the curve continues to change there is doubt concerning the complete healing of the infarction. It is questionable, however, if one should rely too much on this feature in determining the period of bed rest.

The management of the patient after he is allowed out of bed is of the utmost importance. It is essential that the physical activities be carefully regulated and not extended to the point where there is shortness of breath or pain. Thereafter it is a matter of regulating the habits of living so that the individual may as far as possible stay within the limits of his cardiac disability. In order to attain this objective the patient necessarily must know the means of safeguarding himself and remain under the general supervision of his physician. Finally, it should be borne in mind that coronary thrombosis represents the terminal stage of arteriosclerosis of the coronary vessels and therefore the occlusion of other vessels may and frequently does occur.

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#### BIBLIOGRAPHY

1. Feil, Harold: Preliminary Pain in Coronary Thrombosis. *Am. J. M. Sc.* **193**:42 (January) 1937.
2. Sampson, John J., and Eliaser, Maurice, Jr.: The Diagnosis of Impending Acute Coronary Artery Occlusion. *Am. Heart J.* **13**:675 (June) 1937.
3. Master, Arthur M.; Dack, Simon, and Jaffe, Harry L.: Postoperative Coronary Artery Occlusion. *J. A. M. A.* **110**:1415 (April 30) 1938.
4. Blumer, George: The Importance of Embolism as a Complication of Cardiac Infarction. *Ann. Int. Med.* **11**:499 (September) 1937.
5. Smith, Fred M.: Treatment of Left Ventricular Failure. *J. A. M. A.* **109**:646 (August) 1937.

It is impossible to reduce the amount of oil secreted by the sebaceous glands, *Hygeia*, *The Health Magazine*, says in reply to an inquiry on how to decrease oiliness of the hair. "The usual advice," according to *Hygeia*, "is to use one of the popular synthetic liquid soaps for shampoo, because they leave the hair drier than the other soaps made from fats and oils. The sebaceous glands are independent organs and their pattern of secretion varies with individuals, the same as any other organic function. During the fourth decade of life the sebaceous glands usually secrete less than before this time, but this is true of most of the secretory organs of the body.

"Shampooing the hair once every other week is a good average, but some excessively oily hair may be benefited by more frequent washings."

## THE INCOMPATIBILITY BETWEEN CONGESTIVE HEART FAILURE AND ANGINA PECTORIS

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AND

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A man 63 years of age had had substernal pain when walking fast, particularly after lunch. Later the pain was infrequent but he became somewhat short of breath under the same circumstances and slight dependent edema developed. He was given 2 grams of digitalis over a period of a week with decided improvement in his dyspnea; but at the end of that time he noticed the pain again for the first time in several weeks.

That the recurrence of pain in this particular case did in fact result from the beneficial effect of digitalis upon the heart muscle might well be open to question; but there is general agreement that in many instances such a result occurs. It is usual for a patient with angina pectoris to lose his pain with the development of congestive heart failure.<sup>1, 2</sup> A number of years ago Wenckebach<sup>3</sup> expressed this general clinical concept as follows: "... heart failure, developing in the course of time, completely alters the clinical aspect; the patient loses his pain and becomes short of breath." And further, "It is not at all rare to find that by pushing digitalis the dyspnea subsides completely but the half-forgotten pain comes back." It appears that there is a certain incompatibility between angina pectoris and congestive heart failure. Danielopolu<sup>4</sup> says, "Far from being of common origin, they are antagonists."

It is with certain aspects of this antagonism or incompatibility that this paper deals.

Although both angina pectoris and congestive heart failure long have been recognized, the explanation of many features relating to each still is incomplete.

The ultimate explanation of congestive heart failure, whatever the details, is in the inability of the muscular pump to move the incoming blood properly. An example of congestive failure, relatively quite rare but simple of explanation, is failure resulting from constrictive pericarditis. Diastolic dilatation is restricted, the ventricle being unable to fill properly. Obviously it cannot pump blood which cannot enter it; congestion supervenes with its classical signs of high venous pressure, engorgement of viscera and edema. The fault here lies not in the ventricular muscle, which may be little impaired, but the result is the same as in the more common cases of congestive failure in which the ventricular muscle itself is at fault.

Frequent causes of muscular impairment are in-

fection, poor circulation due to coronary disease or actual infarction. Reserve may be lowered but the muscle still may be able to meet ordinary requirements. In such a case the muscle moves the incoming blood and no congestion occurs until the reserve is lowered still further so as to be below ordinary requirements, or until an increased amount of work must be done. In the one instance the precipitating cause of the failure is further injury to the myocardium, in the other undue activity.

In either case, with the strain imposed upon it, the ventricle tends to dilate. Its tone is diminished. The dilated ventricle is inefficient because of this impairment in tone and consequently there is diminution in the amount of blood expelled. Its stroke volume is lowered. When this lowered pumping capacity falls below that which is necessary, the ventricle cannot move the incoming blood properly and congestion ensues.

Dilatation appears always to be present and to be an integral part of congestive heart failure, except possibly in a few cases in which, from some cause, the muscle tone is unduly increased, that is, cases with the "systolic tendency." In the effect on the circulation such cases are somewhat analogous to constrictive pericarditis in that the diminished stroke output rests upon improper filling rather than upon loss of tone with dilatation.

In many cases of congestive heart failure, perhaps in most, no precipitating cause of the failure is apparent, the dilatation being gradual and progressive unless arrested by appropriate treatment. Restricted activity lessens the work requirement and tends to relieve the situation. Digitalis improves the pumping capacity of the dilated ventricle, apparently by increasing its "tone." This lessens diastolic expansion and at the same time increases the extent of systole. The dilated heart becomes smaller.

Regarding the ultimate and precipitating causes of angina pectoris, the situation is somewhat the reverse of that in congestive failure. In most cases some precipitating factor, such as effort, emotion, cold or gastro-intestinal disturbances, is quite well recognized. The ultimate cause of angina pectoris, however, in spite of much recent knowledge, in its last analysis still is speculative. Recent theory relates it to myocardial ischemia. In most cases it appears to be true that some degree of coronary sclerosis, generalized or local, is present, but in a certain number of instances, if present, it is of slight extent. In such cases coronary spasm often is postulated. On the other hand it is well recognized that many patients with extreme coronary sclerosis never experience angina pectoris. Some factor in addition to sclerosis appears to be necessary, some factor which is brought into play more readily in the presence of, or which depends on some degree of myocardial ischemia. Or it might be that ischemia produces angina pectoris only in the presence of this other factor. Localized muscle "cramp,"

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localized fibrillary seizures, as well as coronary spasm, have been proposed in explanation.

Whatever the ultimate cause of the syndrome, the patients in whom it occurs commonly exhibit certain well known features. Attention frequently has been called to the rarity or absence of occurrence of angina pectoris in the Negro and in the Chinese.<sup>1, 5</sup> Exceptions occur, but characteristically the patients are of the nervous, "high-strung" type. They are drivers. Hypertension is frequent. They exhibit the "spasmogenic aptitude."<sup>5, 6</sup> Nervous and muscular tone is increased. It may be that this increase in tone also involves the heart. Certain evidence suggests that this is the case.

A characteristic feature in patients with angina pectoris frequently has been noted but its possible significance appears generally to have escaped attention, i. e., in uncomplicated cases the heart is not enlarged.<sup>7</sup> Considering that the syndrome tends to disappear upon the onset of congestive failure (with dilatation of the heart), great importance well may inhere in this characteristic association of angina pectoris with normal heart size and in its attendant implication, i. e., myocardial tone. The rarity of angina pectoris in cases of auricular fibrillation, furthermore, frequently has received comment.<sup>1, 2, 7</sup> Explanation of this lack of association, however, has not been offered. It would appear to lie in the fact that auricular fibrillation characteristically is associated with dilated failing hearts. The effect of digitalis, on the other hand, is to increase ventricular tone; and, as noted previously, it is when tone thus has been increased that angina pectoris is likely to return.

This correlation of angina pectoris with cardiac tone would appear to explain the disappearance of the syndrome with congestive failure, an explanation difficult of achievement purely on the basis of coronary flow, for the effects of failure are to reduce coronary flow through the diminution of ventricular output. This *per se* would tend to promote angina pectoris, not to do away with it. But failure has the opposite effect, coincidentally with diminution of cardiac tone. On the same basis, in congestive failure, digitalis, by increasing output and consequently improving coronary flow, would be expected, were it not for some other important effect, to lessen the likelihood of angina pectoris. In some cases it does so but in the majority it appears to have the opposite effect. The drug increases muscle tone.

By way of contrast it is worthy of note that other measures which, by causing the heart to fill better, would appear to increase cardiac output (and consequently increase coronary flow) but which *per se* do not increase ventricular tone, have been thought to relieve angina pectoris.<sup>8</sup>

These considerations suggest the possibility that a high degree of cardiac tone may be a part of the "spasmogenic aptitude" characteristic of angina patients, and that this muscular tone, especially in the presence of a greater or lesser degree of coro-

nary sclerosis, may be a crucial factor in the syndrome of angina pectoris. In certain instances it may be that it is sufficient of itself without concomitant coronary disease. Whether it is so or not, the apparent incompatibility between angina pectoris and congestive failure brings forward certain interesting questions: (1) Is there something about the patient with angina pectoris which tends to prevent congestive failure? (2) Has angina pectoris been increasing? (3) If so, has there been a corresponding decrease in congestive failure? The problem of whether angina pectoris tends to prevent heart failure must at present rest on hypothetical considerations. If the patient with angina pectoris does indeed exhibit a high degree of cardiac tone this well might tend to prevent the dilatation of congestive failure.

The question of whether the incidence of angina has increased probably cannot be determined with certainty now. It is the opinion of many experienced internists, however, that even allowing for increased "sensitization" on the part of physicians, the syndrome is much more common. One's own experience obviously is not a dependable criterion. My own impression is that along with a rather conspicuous increase in angina pectoris, I have observed a somewhat corresponding decrease in the incidence of congestive heart failure. Only a vast amount of data carefully assembled over a long period of time and over a large area would be of value in determining such a question.

The statistics of the Barnes Hospital for the eleven years of 1927 to 1937 inclusive are interesting although such limited data obviously can by no means be regarded as at all conclusive. In proportion to the total number of admissions, the number of cases of congestive heart failure tended to rise until the year 1932, the number of cases of angina pectoris fluctuating at a more or less constant level. Beginning in 1932 and extending to 1937, the proportional number of cases of angina pectoris tended to rise while cases of heart failure declined rather sharply until 1936. For the years 1936 and 1937 there was an increase in the cases of congestive failure and a decrease (for the year 1937) in angina pectoris. If the compilation of adequate statistics should suggest opposite tendencies in the incidence of angina pectoris and congestive heart failure, over and above various coincidental factors, such finding would be of extreme importance.

That there is a certain incompatibility between angina pectoris and heart failure is well recognized. It is suggested that this incompatibility may be related to cardiac tone. Competent study of certain antagonistic factors in these syndromes might possibly throw further light on the precise mechanism involved in the production of angina pectoris.

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#### BIBLIOGRAPHY

1. Christian, Henry A.: *The Diagnosis and Treatment of Diseases of the Heart*. Oxford Monographs, New York, Oxford University Press, New York, 1928.

2. Lewis, Sir Thomas: *Diseases of the Heart*, New York, The Macmillan Company, 1933.
3. Wenckebach, K. F.: *Angina Pectoris and the Possibilities of Its Surgical Relief*, Brit. M. J., 3306, 809, 1924.
4. Quoted by Wenckebach, loc. cit.
5. Roberts, Stewart R.: *Nervous and Mental Influences in Angina Pectoris*, Am. Heart J. 7:21, 1931.
6. Houston, W. R.: *Spasmogenic Aptitude*, M. Clin. North America 12:1285, 1929.
7. White, Paul D.: *Diseases of the Coronary Arteries and Cardiac Pain*; Edited by Robert L. Levy, New York, The Macmillan Company, 1936, p. 273.
8. Kerr, William J.: *The Treatment of Angina Pectoris by Methods Which Promote More Adequate Filling of the Heart*, Am. Heart J. 16:544, 1938.

## 790 CONSECUTIVE HYSTERECTOMIES WITH DISCUSSION OF TECHNIC

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A series of 790 consecutive hysterectomies, all done by one surgeon using essentially the same technic, are reviewed as a basis for illustrating the technic of hysterectomy and cautery amputation of the cervix. This series of cases extends over a period from 1910 to 1940. All of these cases were seen in private practice.

"Supravaginal hysterectomy" refers to cases wherein either the whole cervix, or a cuff of cervix, and either one ovary or a portion of an ovary or a portion of ovary plus one or both tubes have not been removed. "Panhysterectomy" refers to removal of the uterus, adnexia and cervix from above. The term "vaginal hysterectomy" is self explanatory.

In this series of cases the age incidence of patients treated by the different procedures is shown in the following table.

Table 1. Age Incidence of Patients

Age	Supravaginal Hysterectomy	Pan- hysterectomy	Vaginal Hysterectomy
10-19	1	0	0
20-29	27	7	0
30-39	233	18	1
40-49	338	54	3
50-59	60	23	4
60-69	9	6	2
70 plus	2	1	1

In the entire series of 790 operations there were but eleven vaginal hysterectomies. In 779 cases in which the abdomen was opened the appendix was removed in 555 instances. In the remaining 224 cases the appendix was either small and atrophic, had been previously removed or the patient's condition did not warrant further operative risk. There were 225 cases in which some surgical procedure was done in addition to hysterectomy such as perineorrhaphy, hemorrhoidectomy or some other minor measure.

Kuhn, H. P.: *The Technique of Cautery Amputation of the Cervix*, Surg. Gynec. & Obst. 387 (September) 1927.  
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In the entire series there were 235 cases of supravaginal hysterectomy in which a cautery amputation of the cervix was done prior to abdominal incision for one or more of the following reasons: erosion, laceration, history of leukorrhea or infection. The latter of course, includes most women who have borne children.

For the entire series the average length of hospital stay was as follows: for supravaginal hysterectomy, 14.3 days; for panhysterectomy, 15 days, and for vaginal hysterectomy, 14.2 days.

### PREOPERATIVE PREPARATION

Patients were given either nembutal grs. 1½ or sodiumamytol grs. 3, a 1 to 10,000 bichloride douche, a soapsuds enema and a soap and water abdominal preparation the night before operation. One hour before operation they were given morphine sulphate grs. ½ and scopolamine grs. ⅓. The morning of operation ether, followed by tincture of merthiolate, was used to prepare the abdomen just before the incision was made.

### MORTALITY

In 670 cases of supravaginal hysterectomy there were five deaths, a mortality of .74 per cent; in 109 panhysterectomy cases there were two deaths, a mortality of 1.83 per cent; there were no deaths in the eleven vaginal hysterectomy cases.

Causes of death were as follows: general peritonitis, three cases; bronchopneumonia, one case; hemorrhage, one case; pulmonary embolism, one case; surgical shock, one case, and one patient died on the fourth day and no autopsy was permitted. The diagnosis was questionable.

### VAGINAL PROCEDURE FOR CAUTERY AMPUTATION OF THE CERVIX

After the usual preparation of the perineum, the cervix is grasped by two Lahey forceps and retracted. A weighted speculum and two right-angle retractors are used to protect the vaginal wall. Sharp traction is made and with a Downe's cautery at the proper heat (dull red), controlled by a nurse at the operator's left elbow, the line of cauterization is carried gradually around the cervix, starting just below the vesical fold (figs. 1A and 1B). Cauterization should be carried out gradually so that the vessel ends may be sealed over. The cervical stump is then grasped and inspected for bleeding points. Simple touching of these points with the cautery usually suffices to seal them over (figs. 1C and 1D). A wide iodoform pack with bipp paste is packed loosely in the vagina. A perineorrhaphy, hemorrhoidectomy or both may then be done, if necessary. One must bear in mind that the cervix should not be amputated by the cautery where there is to be further menstruation because of resulting stenosis of the cervical canal. If a perineorrhaphy is done a mushroom retention catheter is often placed in the bladder.



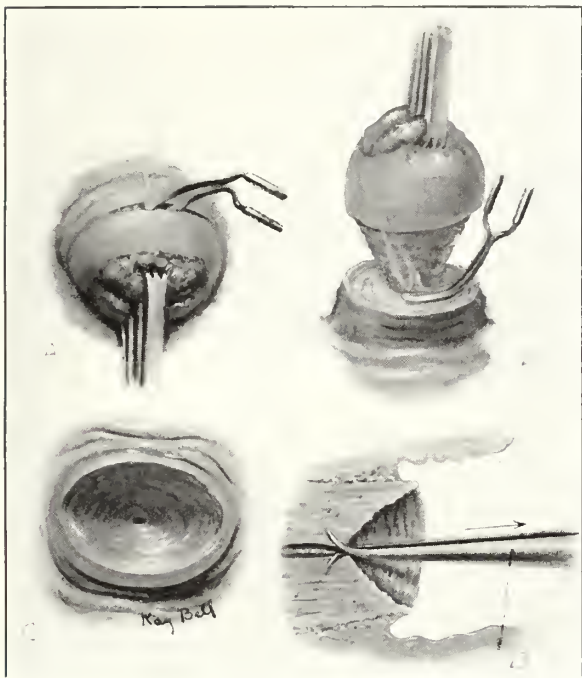


Fig. 1. Cautery amputation technic.

## TECHNIC OF SUPRAVAGINAL HYSTERECTOMY

The usual midline suprapubic incision is made. The vessels of the skin and fat are grasped and ligated and the wound is clamped with dry towels. It is our belief that for maximum asepsis no bowel should be exposed to the wet skin or to wet towels. The fascia is cut and the muscle split by blunt dissection. The peritoneum is then opened. The appendix is isolated and removed. The uterus and attachments are then isolated and completely freed from any adhesions. This is of utmost importance. With a large volsella in the fundus the uterus is held up toward the incision and a self retaining retractor is applied. The bowel is held away by a large wet laporatory sponge. Large Ochsner clamps are placed down the broad ligament, using care to apply them quite near to the uterus. The broad ligament, round ligament and tube are divided between the clamps (fig. 2A). The same procedure is repeated on the opposite side. In certain cases where the uterus is large, it may be necessary to apply another clamp to the uterine artery alone. The bladder reflection is now incised and separated anteriorly by blunt dissection (fig. 2B). The cervical stump is cut anteriorly and grasped with a Lahey forceps (figs. 2C and 2D). The same maneuver is carried out posteriorly. With a curved spear pointed needle threaded with double chromic No. 1, three-fourths length, a good double stitch is made in the edge of the cervix and the suture is swung around the uterine artery clamp. A tie is made there (fig. 2E). The suture is then run over and over up the broad ligament clamp, care being exercised not to interlock the suture (fig. 2F). With the suture held tight, the clamp is slipped out and the

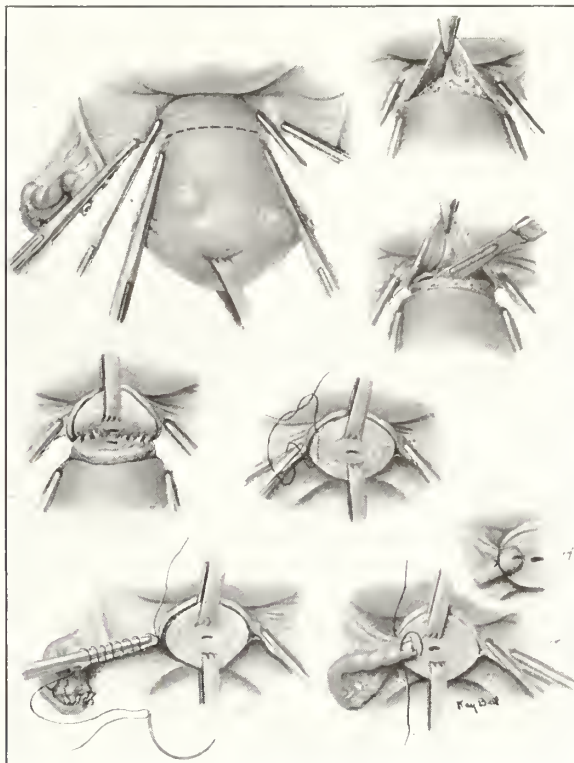


Fig. 2. Hysterectomy technic.

broad ligament with its attachments is slid down to the cervix with a damp sponge in the other hand. The needle is now placed in the posterior cut edge of the cervix and a tie is made over the end of the reflected broad ligament and its attachments (figs.

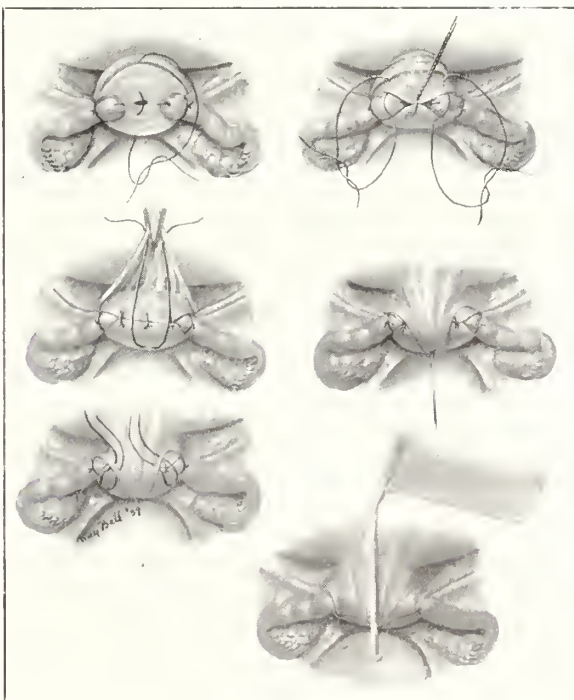


Fig. 3. Hysterectomy technic.

2G and 2H). The opposite side is sutured in a manner similar to the first. The cervix is closed with three sutures, the central one being retained for traction (figs. 3A and 3B). The bladder peritoneal fold is grasped and a suture of single chromic No. 1, one half length, is run through the fold to the posterior surface of the cervical stump and back through the vesical fold (fig. 3C). When tied, the peritoneal vesical fold is pulled down over the raw cervical stump (fig. 3D). This suture is retained as a retractor.

A second and a third suture are placed in a like manner on either side (fig. 3E), the finished surface appearing as in figure 3F. A sponge is placed in the cul-de-sac and if it is removed dry, the retraction suture placed as shown in figure 3D is cut. After routine palpation of the gallbladder, it has been our custom for some time to place 50 cc. of amfetin in the abdominal cavity (fig. 3F). Closure in layers without drainage is now accomplished. In the average case the entire procedure, both vaginal and abdominal, should not take over forty minutes. If any of the adnexia require removal, the same general principles hold true. The original Ochsner clamps are used to incorporate these structures and closure of the round ligaments and broad ligaments over to the cervix is done in the same manner as when the tubes or ovaries are not removed.

In cases of panhysterectomy the same general procedure is used, drawing over the uterine attachments to the sutured vaginal vault.

#### POSTOPERATIVE TREATMENT

After returning the patient to bed, 500 cc. tap water proctoclysis is started which is renewed as often as necessary so that the patient receives from 2,500 to 3,500 cc. of fluid in twenty-four hours and voids from 1,200 to 1,500 cc. in twenty-four hours. Often 1,000 cc. of 5 per cent glucose in normal saline is used intravenously instead of an equal amount of fluid by proctoclysis.

We allow morphine, grs.  $\frac{1}{4}$ , or pantopon, grs.  $\frac{1}{8}$ , to be given as circumstances may require for discomfort. Patients are allowed warm water by mouth when it can be tolerated without causing vomiting. The diet ranges from liquid to soft until the fifth or sixth postoperative day.

Vaginal or rectal packs are removed after twenty-four hours and after forty-eight hours a warm lysol douche is given daily until the cervical stump is healed. Healing usually occurs in about three weeks. If a retention catheter has been used it is removed about the fourth postoperative day. Stitches are removed on the seventh or eighth postoperative day and patients may be out of bed on the tenth or eleventh day and usually go home from the twelfth to fourteenth day after operation.

#### CONCLUSIONS

1. A series of 790 consecutive hysterectomies by one surgeon from private practice is presented with

a general mortality rate of .88 per cent. Of the supravaginal hysterectomies the mortality was .74 per cent and in panhysterectomy 1.83 per cent. There were no mortalities in the vaginal hysterectomy cases.

2. A rapid, almost bloodless technic for hysterectomy is presented which requires only a small amount of catgut to cover satisfactorily all raw surfaces.

3. A technic for high amputation of the cervix is presented which lessens the disquieting sequelae of discharge and pain as well as the occurrence of cancer of the stump.

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### LABORATORY AIDS IN THE DIFFERENTIAL DIAGNOSIS OF JAUNDICE

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Except for the tests of routine nature performed on all patients in the modern hospital such as urinalysis, blood counting, Wassermann and ordinary blood chemistry, perhaps the most frequent special tests ordered by the clinician involve some phase of liver function. The liver has a variety of functions and certainly there can be no single test for "liver function," although many such tests have been devised and advocated. Many of these virtually have been discarded and most of the rest perhaps should be discarded as the results have been disappointing and often actually misleading. A few tests have survived and under certain conditions may be quite informative, particularly when the patient is jaundiced.

Jaundice of itself is evidence of disturbance in the excretion of bile. A notable, if uncommon exception is carotenemia, a pseudojaundice that has been seen in patients who have subsisted on a diet of carrots for long periods. Jaundice may be classified according to three types, namely, obstructive, hepatic and hemolytic. It is essential that the type of jaundice be determined as the type of treatment depends almost exclusively upon this classification. An error in classification is apt to be fatal; for example, the disastrous results of surgically exploring the common bile duct for a stone or other obstruction in a case of jaundice from toxic hepatitis must haunt any thinking surgeon. Since the classification is frequently difficult and often arrived at only after careful consideration of all factors, we frequently find the laboratory called upon for consultation. This clearly leaves it up to the laboratory to have precise information to offer and always to avoid misinformation. Therefore it is essential that the formation of and circulation of bile and its constituents be clearly understood both in the normal and in the jaundiced individual as most of the use-

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ful laboratory tests are intimately related to this substance.

Bilirubin, or bile pigment, is, according to the more modern theory, produced by the cells of the reticulo-endothelial system (spleen, bone marrow, Kupffer's cells of liver) from hemoglobin as a by-product of the destruction of red blood cells. It is not produced in the parenchymal cells of the liver (Green et al.<sup>1</sup>). The liver has been said to serve as an excretory organ with respect to the bilirubin. This is probably true, but certain other changes also occur while the bilirubin is passing through the liver cells. The bilirubin, after it has passed through the hepatic parenchymal cells, is of a different character than before. This modification of the bilirubin is the basis for the different van den Bergh's reactions (Barron,<sup>2</sup> Soffer<sup>3</sup>). Unchanged bilirubin of the type which is normally present in the blood serum gives an indirect van den Bergh's test and does not appear in the urine. The changed bilirubin after it has passed through the hepatic parenchymal cells gives a direct van den Bergh's reaction and appears in the urine. Therefore the van den Bergh's test would appear to be of great value in the differential diagnosis of the three types of jaundice. In the hemolytic type of jaundice, best seen in the familial jaundice, the van den Bergh's reaction early is indirect as the blood serum then contains only unchanged bilirubin. On the other hand, when the jaundice is due to obstruction of the larger bile channels or to extensive diffuse necrosis of the hepatic parenchymal cells, the reaction is direct. Hence, it would seem that the van den Bergh's test is quite valuable in the classification of jaundice. However, it only differentiates between the true hemolytic jaundice and the other two types. It does not differentiate between the obstructive type and the hepatic type and the latter two types constitute a large majority of the cases seen. Furthermore, in the hemolytic type of jaundice there is normally some hepatic parenchymal cell damage after the condition has persisted and the van den Bergh's test, which early in the condition is indirect, may later be found to be direct. Therefore we cannot expect too much help from the van den Bergh's test, and we now have other tests that are more informative.

Bile contains among other substances in addition to bilirubin, cholesterol. Normally the blood contains about 200 mgms. of cholesterol per 100 cc., about 50 per cent of which is in the form of its esters; thus the blood normally contains about 100 mgms. of cholesterol ester per 100 cc. Most of the cholesterol of the human body is believed to be exogenous in origin although small amounts may be endogenous in origin (Muller<sup>4</sup>). The liver is the main regulator of the amount of cholesterol in the blood and it is the main excretory organ for cholesterol. The liver also has the power of uniting fatty acid and cholesterol to produce cholesterol esters. This latter process may also be reversed, that is, the liver is also able to split up cholesterol

esters into fatty acid and cholesterol. On this basis, it must be obvious that in the common obstructive jaundice, both the cholesterol and the cholesterol esters will be increased in the blood stream and in their usual proportions (esters 50 per cent). On the other hand, in jaundice of liver cell destruction the total cholesterol will usually be decreased while the cholesterol esters will always be decreased and out of proportion, often being only 25 per cent or even 10 per cent. This is not so easily explained. We might theorize that the damaged liver cell cannot so readily perform its function in uniting cholesterol and fatty acids to produce cholesterol esters which would explain the decided drop of the latter but we cannot so easily explain the lowering of the total cholesterol content. It is quite possible that in the absence of bile, the cholesterol is not so readily absorbed from the intestinal tract as we find in the failure of absorption of vitamin K in cases of jaundice. In jaundice of the hemolytic type, there should be no change in the cholesterol and cholesterol ester content, although it has been found that there is often a slight increase in the cholesterol and cholesterol ester content of the blood with no change in the proportions. Here then, is a laboratory test which can be used in most cases of jaundice to differentiate between the various types. Furthermore, when used in series, it may be of great prognostic importance (Epstein<sup>5</sup>), particularly when paralleled with icteric index determinations. As has been said, there is no marked change in the cholesterol-cholesterol ester content or proportion in cases of hemolytic jaundice. The most common type of the latter is, of course, familial jaundice, and in this we have an almost specific laboratory test. In this condition there is increased fragility of the red blood cells which is rather easily tested by placing the patient's red blood cells in varying saline dilutions. Compared to the normal it will be found that in familial jaundice the erythrocytes are more fragile as shown by a low range of resistance to hemolysis in the saline dilutions.

As has been stated, in the ordinary case of obstructive jaundice, the cholesterol-cholesterol ester content of the blood will be considerably increased and in normal proportion. Thus it would seem to be an almost fool proof laboratory test. In many cases this is true but certain obvious facts should be kept in mind. Always it should be remembered that in cases of long-standing obstruction there may be secondary liver parenchymal cell damage which may alter the cholesterol-cholesterol ester findings. Furthermore in the stage of recovery from hepatic jaundice it is not unusual to find the cholesterol-cholesterol ester content of the blood not only to reach a normal figure but to become higher than normal. Hence at this stage a case of hepatic jaundice might be confused with obstructive jaundice. Therefore one must know the clinical course of the patient if the laboratory findings are to be correctly interpreted.

In all cases of jaundice table 1 should be helpful

Table 1. Relationships in Various Types of Jaundice

	Source	Excreted by	Hemolytic Jaundice	Obstructive Jaundice	Hepatic Jaundice
Bilirubin	From destruction of erythrocytes	Liver parenchymal cell	Increased	Increased	Increased
Cholesterol	Mostly exogenous	Liver parenchymal cell	Unchanged	Increased	Somewhat decreased
Cholesterol esters	Synthesized by liver parenchymal cells	Liver parenchymal cell	Unchanged	Increased	Greatly decreased
Erythrocyte fragility			Increased	Unchanged	Unchanged

to the clinician when interpreting the laboratory findings. This is illustrated in the following typical cases.

#### REPORT OF CASES

Case 1. Woman, aged 55, entered Research Hospital complaining of intermittent abdominal pain of ten weeks duration, sometimes generalized but more often in the right upper quadrant. Physical examination showed icterus and moderate tenderness in the right lower abdomen. Gallbladder visualization showed an indefinite shadow of the dye in the gallbladder with some mottling but no definite concentration indicative of stones. Laboratory studies showed the icteric index to be 60, cholesterol 333 mgms. per 100 cc. of blood, cholesterol esters 175 mgms. per 100 cc. of blood (52 per cent of the total). A laparotomy was performed and the common bile duct and gallbladder were found packed with stones. The gallbladder was removed and the stones from the common bile duct were removed. Three days later the icteric index was 25. One month later the icteric index was 10, the jaundice had disappeared and the patient was dismissed from the hospital cured. Final diagnosis was obstructive jaundice.

Case 2. Student nurse, aged about 20, entered Research Hospital complaining of diarrhea of ten days duration. With onset patient had nausea, vomiting and epigastric distress, no abdominal pain. The night before admission she had a chill with temperature of 102 F. The urine was said to be dark in color and voiding was accompanied by severe burning. Physical examination showed jaundice and some tenderness over the gallbladder area. Laboratory studies showed the icteric index to be 40, cholesterol was 163 mgms. per 100 cc. of blood, cholesterol esters were 43 mgms. per 100 cc. of blood (25 per cent of total). The treat-

ment consisted of administration of sugar. Six days later the patient was practically well and the jaundice was almost gone. Laboratory studies at that time showed the icteric index to be 20, cholesterol 204 mgms. per 100 cc., cholesterol esters 109 mgms. per 100 cc. (50 per cent of total). The patient was dismissed from the hospital as cured. Final diagnosis was hepatic jaundice, so-called "catarrhal jaundice" type.

Case 3. Woman, aged 49, entered Research Hospital complaining of gradually increasing jaundice of three weeks duration, highly colored urine, clay colored stools and nausea. Physical examination showed jaundice, epigastric tenderness and an epigastric mass. Gallbladder examination showed no visualization of the dye and no evidence of stones. Laboratory studies on February 26 showed the icteric index to be 90, cholesterol 173 mgms. per 100 cc. of blood, cholesterol esters 44 mgms. per 100 cc. of blood (25 per cent of total). The patient gradually lost ground and on March 4 became stuporous. The icteric index was then 75, the cholesterol was 127 mgms. per 100 cc. of blood, cholesterol esters 9 mgms. per 100 cc. of blood (7 per cent of total). On March 7 the patient died but laboratory tests on the blood taken on the day of death showed the icteric index to be 83, cholesterol was 118 mgms. per 100 cc. of blood and the cholesterol ester 14 mgms. per 100 cc. of blood (12 per cent of total). Autopsy showed extensive necrosis and degenerative changes in the parenchymal cells of the liver as shown in figure 2, which may be compared with the normal liver parenchymal cells seen in figure 1. Further history was obtained in the quest for etiology and it was found that this patient had taken oxyliodide tablets for a week, five weeks before entrance, for the relief of "neuritis," had stopped taking them because of nausea, then had again started to take them when the

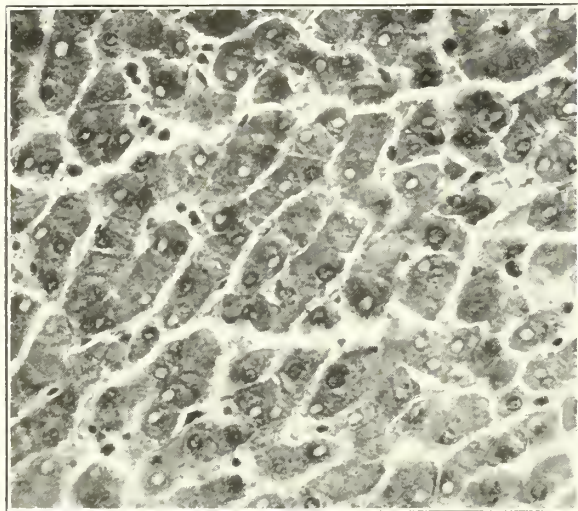


Fig. 1. Microphotograph showing the normal liver parenchymal cells.

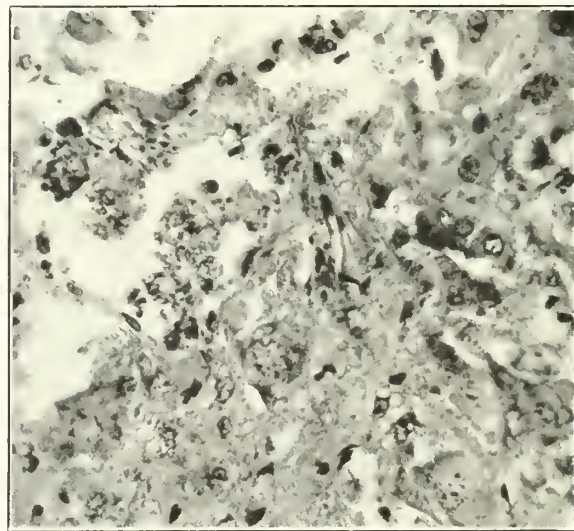


Fig. 2. Microphotograph from the liver of case 3 showing necrosis and degeneration of the parenchymal cells.



present illness developed. Final diagnosis was hepatic jaundice due to drug idiosyncrasy.

Case 4. Man, aged 33, entered Research Hospital complaining of weakness and recurring attacks of painless jaundice for the preceding three years. One year previous to entrance a physician had discovered that his spleen was enlarged. At times he had low grade fever with the attacks of jaundice and some epigastric distress. Had noticed highly colored urine with the attacks of jaundice but no clay colored stools. Physical examination showed an icteric tint to the sclera, a lemon yellow tint to the skin and a palpable mass in the abdomen in the region of the spleen. His temperature was 99 F. each afternoon and evening. Laboratory studies showed the hemoglobin to be 53 per cent, the red blood count was 2,970,000, the white blood count was 6,000 with a normal differential count, the platelet count was 215,000, reticulocytes were 1.52 per cent. The icteric index was 13.6, the van den Bergh's test was indirect positive. A fragility test was performed with the following results: Initial hemolysis: patient .46 per cent saline solution, control .40 per cent saline solution. Complete hemolysis: patient .36 per cent saline solution, control .28 per cent saline solution. Three days later the results were: Initial hemolysis: patient .50 per cent saline solution, control .42 per cent saline solution. Complete hemolysis: patient .36 per cent saline solution, control .28 per cent saline solution.

A splenectomy was performed. The spleen weighed 950 grams. The normal markings were exaggerated, the capsule was rather tense, yet the organ was moderately soft. The cut surface was smooth, rather firm, non-granular, dark red and showed no gross evidence of follicular hyperplasia or fibrosis. About 200 cc. of dark red blood escaped from the organ after multiple sections were made. Microscopical sections showed the malpighian bodies of normal size; there was no evidence of endothelial hyperplasia or phagocytosis of the red cells. All portions except the central artery of the malpighian bodies were engorged with red blood cells. There was no increase of pigments. Seven months after splenectomy the patient had gained 27 pounds and his general health was better than it had ever been in his life. Four years later the fragility test was essentially the same as before operation. Final diagnosis was hemolytic jaundice, familial type.

#### DISCUSSION

It has been shown that jaundice may be any of several types and that certain laboratory tests may be of value in differentiating these types. The physiology of the substances tested has been discussed both in the normal and in the jaundiced patient in order to establish a rationale for the employment of the tests advocated. Certain inferences, however, should not be made. The cholesterol-cholesterol ester determinations should not be employed as a test for "liver function." So far as I know from my own fairly large experience and from the larger experience of well known authorities, the test is of little or no value except in the presence of jaundice and then is used in differentiating the various types of jaundice and not as a "liver function" test. Furthermore, it should be recognized that these tests are quite complicated technical procedures. No one can perform the tests accurately the first few times and even one who is familiar with the technic must continually keep in practice. And, in addition, the test is rather expensive and economi-

cally it is unfair to the patient if he pays for it or to the hospital if a flat rate fee is being used to order such tests without clear legitimate indications.

I have stressed cholesterol-cholesterol ester determinations in cases of jaundice but do not intend to imply that the test or its interpretation is 100 per cent satisfactory. In many cases it has been quite useful and occasionally it has averted a catastrophe. In other cases it has been of little value. Never, to the best of my knowledge, has misinformation been given.

#### SUMMARY AND CONCLUSIONS

Jaundice may be classified as obstructive, hepatic or hemolytic. Certain laboratory tests are advocated as often being of value in correctly classifying cases of jaundice. Case histories are given illustrating the laboratory findings in typical cases.

Research Hospital.

#### BIBLIOGRAPHY

1. Green, C. H. et al.: Arch. Int. Med. **61**:655-690 (April) 1938.
2. Barron, E. S. G.: Medicine **10**:77-134 (February) 1931.
3. Soffer, Louis J.: Medicine **14**:185-254 (May) 1935.
4. Muller, G. L.: Medicine **9**:119-174 (May) 1930.
5. Epstein, E. Z.: Arch. Int. Med. **58**:860-890 (November) 1936.

#### DESCRIBE A METHOD OF TAKING X-RAY PICTURES OF CHAMBERS OF HEART

A method for taking x-ray pictures of the chambers of the heart and the blood vessels of the lungs and chest, thus making for more precision in the diagnosis of ailments affecting those parts, is described by George P. Robb, M.D., and Israel Steinberg, M.D., New York, in *The Journal of the American Medical Association* for February 10.

The two men point out that although the x-ray has become almost indispensable to the accurate diagnosis of heart and lung diseases it has given an incomplete picture because the four separate chambers of the heart and their component parts are shown by one shadow and the blood vessels of the chest are seen indistinctly if at all. Diagnosis therefore has had to rely on such indirect evidences of disease as alteration in the size, shape and pulsation of the heart and blood vessel shadows.

By injection of a harmless substance, diotrast, which is impenetrable to the x-rays, and taking x-ray pictures as the substance passes through the heart and blood vessels of the lungs and chest, the two doctors obtain pictures in which the involved parts stand out in contrast to their surroundings.

"No serious consequence," Drs. Robb and Steinberg point out, "has followed 486 injections of 233 patients, many of whom were seriously ill. The method is safe and practical. The technic is exacting, requiring dexterity, precision, speed, teamwork and strict adherence to detail. Proficiency, however, can be acquired through training and practice, and successful performance should be within the capability of every medical center."

The method is most useful in disorders such as widened saclike areas of arteries or veins filled with blood (aneurysm), disease of the aorta, malformations of the heart and veins at birth and disease of the tissues around the heart.

## SYMPOSIUM ON "VITAMINS"

## VITAMINS IN FOOD

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One can obtain all necessary vitamins from food but seldom obtains the full amount the body requires. One almost always obtains enough to avoid pathological states. The reason for any deficiency is lack of knowledge of what vitamin food contains and the amount one must eat of a certain food to obtain the vitamin requirement of daily metabolic necessity. Too few can balance the necessary caloric, mineral and vitamin content of food to form an all around ration. The main reason that the great problem of eating is largely in the dark ages in this scientific world is that neither dietitian nor physician has formulated a program to meet our bodily requirement by using ordinary obtainable foods. Knowledge of the vitamin content of food is not standardized yet although it is well known to a few who have attempted to learn.

The vitamin content of many foods is now established; a few only are unanalyzed in every phase of their content. There is a profound amount of unorganized information in the literature of the last twenty years, particularly the last three years. It is so vast that only a perusal of the entire literature of this field can be the source of information for the proper use of food in order to obtain expected and necessary vitamin requirement in daily eating. Enough is known to be certain that some information of vitamins is important to the practice of the ophthalmologist, dermatologist, neurologist, surgeon, pediatrician, orthopedist, dentist and internist.

It is known that vitamins A, B<sub>1</sub>, B complex, C, D, E and K are all used by man. Vitamins B<sub>1</sub> (thiamin chloride), B<sub>2</sub> (riboflavin and nicotinic acid), C (ascorbic acid), E and K have been synthesized. Only A and D and a few factors of the B complex, or B<sub>2</sub>, have not been chemically isolated and reproduced synthetically.

Small amounts of these chemical compounds are used daily, really a small milligram dosage, and is spoken of as unit value in terms of international units (I. U.) determined by the League of Nation's Board.

The average 150 pound adult daily requires for an ideal state of metabolism along with his caloric and mineral value the following I. U.'s of separate vitamins: A, from 6,000 to 8,000; B, 500; B complex, from 300 to 500; C, 500; D, 500; E and K, undetermined.

## VITAMIN A

Natural vitamin A is obtained from foods and fish oils. The foods present a provitamin A in the

form of carotene. The amount of vitamin A in international units in 100 grams of each of the following is: (A) The red yellow foods: egg, one, 1,000; peaches or apricots, 2,000; carrots, 3,100; Hubbard squash, 4,800; sweet potatoes, 2,800. (B) The dark green leafy vegetables or greens: kale, 27,000; spinach, 8,000; turnip tops, 2,800; mustard, 2,200; dandelion, 1,200; leaf lettuce, 100.

There are many other sources of small amounts but carotene is best obtained from these sources and is metabolized as vitamin A in the body.

## VITAMIN B

Vitamin B<sub>1</sub> (thiamin chloride) daily requirement is 500 I. U. Few people obtain enough B<sub>1</sub> in their daily ration. B<sub>1</sub> deficiency to some degree is almost universal.

The foods that contain the largest amounts of B<sub>1</sub> in every 100 grams of food in international units are: pork, 200; oatmeal (old kind), 180; canned lima beans, 115; sixteen peanuts, 70; unpolished rice, 50; prunes, 25; butter (pad), 36; cheese, 36; liver, 40; beef, 12; chicken, 10; fish, 0; whole wheat bread (one piece), 20.

Vitamin B<sub>1</sub> is the vitamin ruined in white flour preparation. All should use cracked wheat bread, not white bread. One profitably could take a 1 mgm. dose of thiamin chloride daily. The average person needs 300 I. U. of B<sub>1</sub> fortification daily and this is contained in this dosage.

## B COMPLEX

Requirement for the B complex is unknown. Riboflavin is important in the chick but it is not known how important it is in man, probably the requirement being 500 I. U. Nicotinic acid need is 25 mgm. daily. The use of food containing nicotinic acid prevents pellagra. Collards, Brussels sprouts, milk and buttermilk, tomatoes, peas, kale, liver and dry yeast are excellent sources. Their use in diet will cure or prevent pellagra.

## VITAMIN C

The daily requirement of vitamin C is 500 I. U. The scurvy preventive chemical is needed daily. Although poorly stored it is necessary to good teeth formation and protection. Children need it from the day of their birth. It activates collagen, a requisite of healing in wounds. It is easily obtained from citrus fruits (fresh and uncooked). The amount in international units in 100 grams of food follows: parsley (100 gm.), 4,800; red pepper,



4,800; water cress, 2,500; green pepper, 2,400; kale (raw), 1,200; spinach (raw), 1,100; tomato juice, 600; orange, 1,000; lemon, 600; one half grapefruit, 600; lime, 500; coleslaw, 500; cooked cabbage, 0.

#### VITAMIN D

The daily requirement of vitamin D is 500 I. U. Vitamin D prevents rickets and is vitally important to the growth and reconstruction of bone. Children need it until they have full growth of stature. It is vital in diet in winter and early spring. Children require as large a dosage as do adults. It is obtained in food from fish liver oil, irradiated milk and from natural irradiation of skin cholesterol or irradiated ergosterols soluble in vegetable oils. The best natural source is old fashioned cod liver oil. Foods that contain a small amount of D are yellow of eggs, fortified cows' milk, salmon, herring and sardines. The usual source is tanning of the body. Tanning is much more important to maintain sufficient storage than the foods mentioned. Vitamin D is well stored.

#### VITAMIN E

The amount of vitamin E (a-tocopherol) required is unknown. This vitamin is useful in prevention of abortions. It is derived from germ of the wheat seed. This portion of wheat is extracted in white flour preparation, hence a second vitamin deficiency reason for the use of whole grain breads.

#### VITAMIN K

Vitamin K determines prothombin formation. Excellent sources are kale, spinach, alfalfa and green grass. It is absorbed in the intestinal tract

if bile is present. Hence bleeding that follows obstructive lesions of the common bile duct is caused by an inability to absorb vitamin K. Artificial bile then becomes necessary for its absorption when food that contains vitamin K are given to jaundiced patients.

Thirty-two vitamins have been isolated, A, B, B<sub>2</sub>, C, D, E and K being the most important to the well-being of man. There are sources of each not yet determined. I have simply endeavored to outline the main sources in food. I wish to call attention to the fact that kale is probably our most productive source of all vitamin containing foods and has the greatest concentration therein as compared to any other vegetable or fruit. The national diet must emphasize the value of kale, spinach, oranges, oatmeal, pork, liver and dry yeast. They each contain vital and useful percentages of necessary vitamins.

Table 1. Vitamin Content of Foods

Food	I. U.					
	A	B	C	D	E	K
Kale	27,000	100	1,200	Trace	0	+++
Pork		200				
Spinach	8,000	50	1,100			++
Liver	0	40	B <sub>2</sub>	Very much		
Yeast	200		B <sub>2</sub>	Very much		

Most foods contain several vitamins in varying amounts. Most persons are intermittently low in their ingestion of dietetic vitamins. This will remain true until it is learned what and how much to eat of foods that really are known to contain vitamins as well as necessary calories and minerals.

In conclusion, may I say that physicians simply must take time to learn the vitamin content of food.

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## THE CHEMISTRY OF VITAMINS AND OF VITAMIN DEFICIENCY DISEASES

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The experimental study of foodstuffs during the last thirty years has been remarkably successful in bringing to light those chemical substances, the vitamins, which make up such an infinitesimal part of the daily food and yet play such a dominant role in its utilization. The chemical identity of the compounds which prevent the five best known human nutritional deficiency diseases has been established by the isolation of the active materials from natural sources and the subsequent determination of structure. These five dietary essentials are: vitamin A, the antixerophthalmic vitamin; thiamin, the antiberiberi vitamin; ascorbic acid, the antiscorbutic vitamin; vitamin D, the antirachitic vitamin; and, nicotinic acid, the antipellagra vitamin. A sixth vitamin, riboflavin, which prevents a specific dermatosis in man belongs in this same group but is listed separately because it has not been associated

with the historically important avitaminoses. It is to be noted that only two of these six vitamins retain their alphabetical designations. Chemical names for vitamins A and D have not yet been accepted officially.

The chemical structure of the following vitamins, indispensable in the diets of other species than man, has also been established: vitamin E, the antisterility vitamin in rats; vitamin B<sub>6</sub>, the antidermatitic vitamin in rats; vitamin K, the antihemorrhagic vitamin in chicks; and, a so-called filtrate factor, antidermatitic in chicks. There is suggestive evidence, in addition, for the existence of at least six other vitamins required by rats or chicks. Future work may demonstrate that man may need certain of these vitamins. It has been definitely determined, for instance, that vitamin K has clinical value and there is some evidence of the clinical importance of vitamins E and B<sub>6</sub>.

The six vitamins which are known to be impor-

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tant in human nutrition may be obtained in pure crystalline form with definite physical characteristics just as can many common chemical compounds. It is difficult to realize that some already have become the stock in trade of almost every pharmacy. In fact, nicotinic acid was a familiar organic reagent for years before its nutritional importance was known. These compounds, grouped under one name, are of most varied chemical nature although they seem no more complex than innumerable compounds known to the organic chemist. Indeed it seems strange that tissues which synthesize hormones such as adrenalin and theelin are unable to synthesize vitamins such as thiamin and ascorbic acid. Partial synthesis of vitamin A does occur in most species since this vitamin may be formed from the common orange yellow plant pigment, carotene. Carotene or provitamin A, however, cannot be synthesized by animal tissues. The conversion of provitamin D in subcutaneous tissues into the antirachitic vitamin under the influence of sunlight or of ultraviolet light is not a synthesis of a vitamin by animal tissues because the same result is obtained by the irradiation of inert materials containing provitamin D. The latter observation is of practical importance because it permits the fortification of foods with vitamin D, the vitamin which is least widely distributed in nature.

The diagnosis of severe and uncomplicated avitaminoses is a relatively simple problem compared with the recognition of moderate or subacute deficiencies. Informative tests which will indicate the exact nutritional state of an individual suffering from a mild hypoavitaminosis are greatly to be desired. Such tests are not available at present although current investigations are promising in this respect. There are no accurate and convenient quantitative methods for the determination of the concentration of the vitamins, except ascorbic acid, in body fluids. The "indophenol titration" has been used with success in the estimation of serum ascorbic acid as well as in the estimation of the degree

of saturation of the tissues with this vitamin. There seems to be a definite renal threshold for ascorbic acid and this is probably true of the other water soluble vitamins. Inasmuch as vitamins are concerned with metabolism, abnormal metabolic products or variations in the concentration of normal constituents might be expected in blood and urine as a result of deficiencies. Although rickets is generally associated with a decreased serum phosphorus, beriberi with an increased blood pyruvic acid and pellagra with an increased porphyrinuria, the therapeutic response to vitamin administration is still the surest demonstration of the need of a vitamin.

The specific role which each vitamin plays in metabolism is as yet unknown. Why the antirachitic vitamin increases the net absorption of calcium and promotes calcification, why vitamin A maintains normal epithelial tissue and why ascorbic acid preserves normal capillary structures are unsolved problems. The demonstration that vitamin A is a constituent of the visual purple does offer a satisfactory explanation for the occurrence of night blindness in vitamin A deficiency. Furthermore, definite information is at hand regarding possible roles of thiamin, nicotinic acid and riboflavin because these three are now known to occur as essential parts of enzymes in enzymatic systems concerned with tissue oxidations. Thiamin, for instance, forms the enzyme, carboxylase (thiamin plus  $2\text{H}_3\text{PO}_4$  plus a specific protein) which is necessary in one or more of the intermediate stages of the metabolism of glucose. It is significant that the curative effect of thiamin in avian polyneuritis has been simulated in "test tube" experiments in which the metabolism of tissue preparations from thiamin-deficient birds has been studied with and without added thiamin. Such investigations, using "model" enzymatic systems, may supply the key which will ultimately make known the exact functions of these mysterious and potent compounds.

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## THE COMMON INSTANCES OF VITAMIN B DEFICIENCY

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Deficiency in vitamin B produces definite clinical conditions which are not uncommon and which are easily recognized. It is common to speak of a vitamin B complex, by which is meant a product which contains all the fractions which recently have been identified separately. These fractions are chiefly riboflavin which is found in liver, thiamin chloride which is found in the covering of grains and in brewer's yeast and nicotinic acid.

The most interesting conditions in which various vitamin B deficiencies are encountered are

pernicious anemia, pellagra and sprue. In pernicious anemia, although the most important deficiency is that of primary liver factor, there is undoubtedly a deficiency in vitamin B, and it has been shown recently that reticulocytosis may be stimulated by extracts of brewer's yeast. Since vitamin B usually is associated with neuritic disturbance, thiamin chloride may be important in the treatment of pernicious anemia with regard to the nervous manifestations.

In the condition known as sprue the neurological manifestations are not usually present, the gastro-



intestinal disturbances are accentuated and there may be a type of anemia similar to pernicious anemia. These cases, while uncommon in ordinary practice, nevertheless, are known to occur. In pellagra there is seldom an absence of the intrinsic liver factor so the blood picture is usually normal. But added to the intense gastrointestinal disturbances there is the peculiar lesion of the skin and also a psychotic state. All these diseases begin with nutritional deficiencies, of which the deficiency in the various fractions of vitamin B is highly important. In the case of pellagra the use of nicotinic acid has been shown to be essential to successful treatment. But the use of thiamin chloride is also important. It has come within my experience in the last two years to see four patients with numbness and tingling of the hands and feet, without anemia but with macrocytic type of blood smear, in whom hydrochloric acid was absent in the stomach, and in whom nearly complete recovery was accomplished by the use of parenterally injected thiamin chloride and liver extract.

The influence of vitamin B on the digestive system is likewise important and glossitis, commonly seen in hospital service in those patients in whom there is some reason such as cancerous disease starvation is present. The effect of vitamin B deficiency is heightened in these patients if they are fed alcoholic mixtures, such as eggnog, since it has been shown that alcohol interferes with the absorption of vitamin B. Before 1935, the syndrome of alcoholic neuritis plus chronic delirium

was frequently fatal. Since that time it has been shown that the condition is curable if the patient is fed adequate amounts of vitamin B.

Besides its use in these definite conditions, vitamin B, including thiamin chloride and nicotinic acid, has been used with interesting effects in delirium tremens and the insomnia accompanying barbiturate addiction. In the treatment of alcoholic neuritis the use of vitamin B is, of course, essential.

Not so much is known about riboflavin. It has been found to be associated with some scaly conditions of the face and arms and occurs in the liver. Deficiency in this factor may be responsible for the unfavorable development of severe infections but the most important and most commonly used fractions of vitamin B are thiamin chloride and nicotinic acid. Thiamin chloride may be administered by mouth or hypodermically and the average daily dose may be from 1 to 10 milligrams during the acute phases of illness. Nicotinic acid may be used by mouth or intramuscularly in doses of from 50 to 150 milligrams a day. Nicotinic acid has interesting effects on the circulation, producing local dilatation. Thiamin chloride has been used with reported success in the treatment of multiple sclerosis. There are many other suggested uses, but the importance of vitamin B has probably been exaggerated in many situations; certainly it does not replace the old-fashioned bitter tonic as a stimulator of appetite.

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## VITAMIN DEFICIENCY AND RICKETS

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Rickets is a chronic disease resulting from improper nutrition. It is not surprising, therefore, to find traces of the disease in skeletons of the ancient Indian races of North America and primitive man of older nations. The etiological factor precipitating the disease is a lack of vitamin D, which, when insufficient in the diet of man, disturbs the normal relationship between calcium and phosphorus in the body tissues. Contributing factors are high sugar diets, dark skins, overfeeding, underfeeding, chronic digestive diseases, syphilis, poor hygienic surroundings, lack of sunshine, prematurity and chronic debilitating diseases. Heredity seems to be a factor in certain families. This tendency toward the disease has been observed many times.

### **PATHOLOGY**

Rickets is a metabolic disease and as such, no tissue of the body escapes its presence. The systems most affected are the bones and the lymphatic structures.

*Bones.*—An abnormal ratio between the phos-

phorus and calcium of the body prevents the osteoid tissue from being transformed into true bone. It appears that a lowering of the phosphorus in the blood due to the excessive excretion of both calcium and phosphorus is responsible, at least in part, for the failure of normal bone development. This faulty metabolism of phosphorus is precipitated by lack of vitamin D. Minerals are necessary for the digestion of food. Overfeeding promotes rapid growth and this predisposes the individual to rickets. Underfeeding has the opposite effect because the calcium and phosphorus are not drained from the system by excessive digestion. The disease is most easily demonstrated at the wrists, ankles and costochondral junctions. The bones are larger and softer than normal. The flat bones of the body seem thinner, especially the skull, which tends to deviate from the normal both in size and contour. Microscopically, sections of rachitic bones show hyperemia and excessive proliferation of cartilage, the change from cartilage into bone being most irregular and usually over-

developed. The periosteum is thickened. As the trabeculae are absorbed, there is an increase of the medullary spaces.

*Lymphoid Tissue.*—The lymphatic system shows marked change in a well developed case of rickets. The liver, spleen and superficial lymph glands are often enlarged. The lymphatic tissues of the entire body may show changes in a well pronounced case.

*Symptoms.*—Early signs are sweating of the head, restlessness at night, enlargement of the epiphysis of the long bones and a flattening of the membranous bones, especially the skull, delay in dentition with an early tendency toward teeth decay, muscular weakness and anemia. In the severe cases one sees marked curvature of the long bones with marked increase of the epiphysis, pot belly, pigeon breast and beading and flaring of the ribs, known as the "violin chest." Delay in walking, abnormal curvatures of the spine, hypertrophy of the tonsils and adenoids, peculiar nervous manifestations such as head rolling or body rocking are seen. The rachitic child seems unduly irritable. The skin is usually pale and the subcutaneous tissue flabby. Blood studies show a marked secondary anemia.

*Complications.*—Upper respiratory infections such as colds, otitis media, laryngitis, bronchitis or bronchopneumonia are frequently found. Seldom does the disease progress to such a degree that bones have to be straightened surgically. The changes in the flat bones are more likely to be permanent, especially in the pelvis. Secondary anemia may be so severe as to approach or even cause the development of von Jaksch's disease. Tetany may result in those cases which have a marked disturbance of body minerals.

*Diagnosis.*—In the mild cases, roentgen ray will show a cupping, enlarging diaphysis and a haziness in the epiphyseal line. In the more severe cases bone changes, nervous irritability, secondary anemia, lymphatic enlargement and a physical delay of development are the more prominent signs.

#### RENAL RICKETS

A condition long thought to be allied to rickets is renal rickets which falls also in the starvation category. In this condition, it is thought that an excretion of endogenous phosphorus occurs in the intestine. This phosphorus combines with the calcium present as insoluble calcium-phosphorus and thus blocks the absorption of calcium. Changes in phosphorus metabolism are of course directly attributed to malfunction of the kidney and this malfunction causes the building up of endogenous phosphorus. The primary changes occurring in the kidney are thought by some to be directly attributable to many individual mechanisms. Among the commoner theories are the influence of the pituitary on the kidney, infectious processes affecting the kidney and primary arteriosclerosis

of the glomeruli themselves. Since the primary changes are manifest by disturbances in the metabolism, the metabolism disorders themselves cause a definite change in the growing organism. The changes consists mainly of retardation of growth both generally and in certain structures of the body. The osseous changes are noteworthy, epiphyseal enlargement at the wrist and costochondral junction, bossing of the skull and deformities of the extremities. Genu valgum is often a pronounced symptom. Of roentgenological interest is the peculiar translucence and spongy appearance in these bones.

#### DIFFERENTIAL DIAGNOSIS

*Congenital Syphilis.*—Saber tibiae at times resemble rickets. This can be differentiated from rickets by roentgen ray of the bone which will show, as a rule, osteochondritis and periostitis of the tibiae. There also may be areas of rarefaction. Cretinism may present signs similar to those of rickets in that there is a slowness in growth in the length of the bones and a delay in development of the epiphyses. Osteogenesis imperfecta resembles rickets in that there is a thinning of the flat bones and some deformity of the long bones. Osteosathyrosis is often confused with rickets in that children so afflicted frequently fracture bones. In this condition, which is sometimes called fragilitas ossium, the bones are brittle and the shafts and cortices of the bone are thin. Infantile osteomalacia resembles rickets closely in that there is a softness of the ribs and at times a bowing of the legs. Roentgenograms of such bones will fail to show the presence of rickets.

*Course and Prognosis.*—Course and prognosis depend on the severity and duration of the disease. Minor bone deformities disappear although the head may remain larger than normal. Under treatment, most bone deformities return to normal, the secondary anemia clears up and the individual makes an uneventful recovery. In the more severe cases, upper respiratory infections may at times cause death by eventually producing a bronchial pneumonia. Convulsions in a rachitic child should lead one to suspect the presence of tetany.

#### VITAMIN D

*Treatment.*—Nearly all forms of plant and animal life are capable of developing vitamin D. While it is an established fact that plants do not need vitamin D, yet they do develop it in small quantities. Most plants are capable of stepping up the vitamin D content when exposed to sunshine or ultraviolet ray, especially the fungi and moulds such as ergot and yeast.

If the fodder, the cows themselves or the milk undergo a process of irradiation, the potency of vitamin D in milk is increased. The amount of vitamin D is measured in units. This scale is international. Medicinal cod liver oil should contain 100



units per gram. Different fish oils vary in the amount of vitamin D present, blue fin tuna containing 40,000 I. U. per gram while liver of cod contains 1,000 I. U. If dried yeast is exposed to the sun, vitamin D will increase potency to one hundred times that of the cod liver oil.

Many believe that milk and butter contain large quantities of vitamin D. Unless the feed, the cow, or milk is irradiated, one is likely to draw erroneous conclusions because milk contains a substance which will produce calcification but which has nothing to do with the presence of vitamin D. Egg yolk is one of the best sources of vitamin D at our disposal.

One may get the impression that the average child receives too much vitamin D. Before toxic symptoms can arise, enormous doses must be given. The toxic effects which arise depend upon the dosage, the method of administration, the calcium and phosphorus content of the diet, the age and activity of the patient and the individual's susceptibility.

These same factors hold true in the treatment of rickets. Some children require little cod liver oil and egg yolk while others require large amounts of vitamin D.

In renal rickets, any form of vitamin D is contraindicated.

#### CHEMICAL CONSTITUTION AND PROPERTIES OF VITAMIN D

The association of antirachitic activity of fish liver oils and irradiated foods with the sterol fraction was based at least partly on the finding that cholesterol could be activated by irradiation. Evidence, however, rapidly accumulated which seemed to indicate that the precursor of the active substance was not cholesterol but some other sterol associated with it. Because of the similarity of its properties and those of the provitamin, attention soon was directed to ergosterol and unsaturated sterol.

Work directed toward isolating the antirachitic substance produced by the irradiation of ergosterol was successful finally in the hands of two groups

of workers. The crystalline substance was called "calciferol" by Askew and coworkers and vitamin D<sub>2</sub> by Windaus and associates. This substance has an antirachitic potency of 40,000 international units per milligram.

As shown by formulas, the active substance is formed from ergosterol by the rupture of the band between carbon atoms 9 and 10.

In earlier work some investigators were unable to free cholesterol completely from activatable material. Additional evidence accumulated which indicated that the provitamin in cholesterol could not be ergosterol. It was shown that irradiated ergosterol and the vitamin D of cod liver oil behaved differently in rats and chicks. While both have the same potency in rats, the former is much less effective in curing chicks than an equivalent quantity of the latter (based on the rat assay). Utilizing this observation, Waddell showed that irradiated cholesterol differed from irradiated ergosterol in that it was as effective as cod liver oil for the chick. It was therefore concluded that the provitamin D of cholesterol was not ergosterol and that the active substances obtained by their irradiation were different.

These observations directed attention to 7-dehydrocholesterol. This substance was synthesized by Windaus. Upon irradiation it yielded a product which was more effective antirachitically in chicks than irradiated ergosterol was.

Irradiated 7-dehydrocholesterol was called vitamin D<sub>3</sub> by Windaus and is apparently identical with the antirachitic substance isolated from tuna fish liver oil by Brockman.

#### VITAMIN D<sub>3</sub> (IRRADIATED 7-DEHYDROCHOLESTEROL)

The activation depends upon the disruption of the band between carbon atoms 9 and 10.

Recent work indicates that other natural forms of vitamin D exist and that any given fish liver oil contains a mixture of at least two forms, the proportions of which may vary from species to species.

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## OCULAR MANIFESTATIONS OF VITAMIN DEFICIENCY

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#### VITAMIN A

The oldest described deficiency disease encountered in ophthalmology is vitamin A deficiency, xerophthalmia, or keratomalacia. This condition is rarely seen in the United States. However, it is encountered rather commonly in some areas of China and the Far East where the diet is limited to one or two foods as in North China where the diet is rich in soy bean flour.

Figure 1 is that of a baby who was fed soy bean

flour without any supplement to the diet and developed keratomalacia. When placed on a high vitamin A product, recovery was rapid. In this instance, the xerophthalmia almost completely disappeared in eight days.

When a concentrate of vitamin A is desired, I prefer to use carotene in oil for both topical and internal medication because it is odorless and practically tasteless. The oil must be a vegetable derivative, otherwise the carotene will break down.



Fig. 1. Avitaminosis. Note scars on the cornea from keratomalacia and petechial hemorrhages on the cheek. Principally A and C deficiency.

One of the most common diseases in ophthalmology is seborrhea of the lids or superficial marginal blepharitis, or commonly known by the laity as granulated eyelids. This condition practically always is associated with seborrhea elsewhere on the body and complete relief is not obtained until proper corrections are made in the diet. Carotene has a definite role in this condition. In certain types of marginal keratitis and corneal ulcers, carotene is used locally in the eye and also by mouth.

Vitamin A has a definite role in night blindness but it varies widely in different individuals. Thomson et al.<sup>1</sup> studied a large series of cases that had controlled diets and his conclusion was that dark adaptations and vitamin A are related. However, the tests at the present time and the technic and interpretation of the results have made it impossible to be certain to what extent the recorded observations represent the physiological facts.

In general, I instruct patients to eat the foods that are yellow to increase the vitamin A content in their diet.

#### VITAMIN B

Vitamin B and the complex, both hypodermically and by mouth, have important roles in modern day ophthalmology. It certainly should be used in all tobacco and alcohol amblyopia. Headaches, nausea and dimness of vision are frequently observed with the over indulgence of tobacco. One finds that vitamin B aids in disposing of these complaints.

I recently had a patient who smoked from sixteen to eighteen cigars a day and had the complaints mentioned. He was given 600 units of B<sub>1</sub> a day and was told to stop smoking. He said that he had tried this several times but would become nervous and irritable. However, after being on the thiamin chloride he said that it was quite easy for him to stop smoking.

I use B<sub>1</sub> in neuropathic keratitis such as dendritic ulcers but have found it to be of questionable value. It has not proved of any value in retrobulbar neuritis. I use it frequently in obscure headaches that cannot be accounted for from the eye standpoint or by any medical disability. I believe it is of value in connection with exercises in convergence insufficiency. People who have vitreous opacities, especially the dust type, which have been

present for years, seem to notice the opacities much less when placed on B<sub>1</sub> although there is no apparent change in the density of the opacities.

I also suggest that the patient eat the green, leafy vegetables which are high in thiamin chloride and vitamin A such as kale, spinach and turnip tops. These should not be cooked with bicarbonate of soda in the water as is done by so many cooks who wish their green, leafy vegetables to have a bright, fresh color.

#### VITAMIN C

I use vitamin C in practically all intraocular hemorrhages. I feel that it is of little value other than in borderline scurvy cases, which are extremely rare.

#### VITAMIN D

Vitamin D complex plays an important part in progressive myopia. From the experimental laboratory angle many changes have been demonstrated but clinically not definitely proven. Knapp<sup>2</sup> has shown edema of the sclera fibers of the dog when it is put on a deficient vitamin D and low calcium diet.

There is a definite relationship between certain types of cataracts and calcium and vitamin D deficiency. These cataracts cannot be absorbed or cured by sufficient diet because organic changes have taken place, but the patient should be prepared with sufficient vitamin D and calcium before surgery is instituted.

When one encounters vitamin deficiency in the eye it is usually of a combination of the various vitamins. A typical example of this is that some of the old scars which have been present on corneas for years either break down without any definite cause or they receive slight trauma and the eye becomes irritable again. One finds that products which are high in vitamin A but also contain enough B and D are valuable in these conditions and should be given in large doses. It also has been found that the local installation of carotene in oil in the eye followed by warm applications is efficacious in promoting delayed healing.

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#### BIBLIOGRAPHY

1. Thomson, A. M.; Griffith, H. D.; Mutch, J. R.; Lubbock, D. M.; Owen, E. C., and Logaras, G.: A Study of Diet in Relation to Health; Dark Adaptation as an Index of Adequate Vitamin A Intake, The Rowlett Research Institute, Aberdeen.
2. Knapp, A. A.: Vitamin D Complex in Progressive Myopia, *Am. J. Ophth.* 22:1329 (December) 1939.

#### WORTHLESS GLANDULAR PRODUCTS VIE WITH VALUABLE ONES IN MARKET

"In the past few years a number of pure chemical compounds simulating endocrine preparations have been developed and found to possess potency in duplicating the physiologic reactions of the endocrine glands themselves," an editorial in *The Journal of the American Medical Association* for February 3 states. "In spite of this progress there still appears to be a profitable sale for some products prepared from animal glands which have little, if any, demonstrable activity."



## VITAMIN DEFICIENCY AND PELLAGROUS CONDITIONS

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Pellagra is a deficiency disease, the symptoms of which are chiefly manifest in the skin, the alimentary tract and the nervous system. Lesions in the skin show a remarkable symmetry in bilateral location, size and shape. The erythema or dermatitis occurs most frequently on portions of the body and extremities which have been uncovered by clothing and exposed to sunlight such as the face and neck, the dorsum of the hands and forearms and the bare feet and legs. However, any portion of the skin may become involved. Symptoms in the gastrointestinal tract may be very serious. The mouth and tongue may be inflamed, exfoliation of the epithelium may occur and ulceration with deep furrowing of the tongue appear. The salivary glands are enlarged and tender and there is marked salivation and fetid breath. The hydrochloric acid of the stomach may be decreased or absent.

Lynch<sup>1</sup> made a careful study of the intestine in pellagra and reported that the inflammation is limited practically to the colon; in severe cases it may extend to the terminal ileum. The cecum, sigmoid and rectum usually show most involvement. Nervous symptoms result from lesions in the brain and spinal cord with no special area of predilection.

The onset of the disease is generally insidious. The symptoms and signs may be vague, such as indefinite digestive disturbance and mental depression. In most cases, attention is directed to the disease by the skin lesions. The greatest seasonal incidence is in the spring and autumn.

## TREATMENT

Elvehjem, Madden, Strong and Woolley,<sup>2</sup> in

1937, reported the cure of blacktongue in dogs, which was thought to be canine pellagra, by the use of nicotinic acid and its amide. This suggested its use in treatment of pellagra in humans. In February 1938, Spies, Cooper and Blankenhorn<sup>3</sup> reported the efficacy of nicotinic acid in the treatment of human pellagra. Numerous reports have been published during the last two years corroborating the usefulness of nicotinic acid for this condition.

Many patients to whom nicotinic acid is administered have reactions characterized by flushing, itching and burning sensation in the skin of the face, neck and ears and a reddening of the skin can be observed. These reactions are said to be less marked in patients having active pellagra. If dosages are too large, there may be gastric irritation with abdominal cramps, increased peristalsis, eructation and nausea. These symptoms usually do not appear when proper dosages are given.

It has been observed that symptoms due to vitamin B deficiency such as peripheral neuritis, seen in cases of pellagra, do not respond to nicotinic acid but usually are improved when vitamin B<sub>1</sub> is added.

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## BIBLIOGRAPHY

1. Lynch, K. M.: The Intestine in Pellagra, paper read before the American Society on Tropical Medicine, Miami, Florida, Nov. 21, 1929.
2. Elvehjem, C. A.; Madden, R. J.; Strong, F. M., and Woolley, D. W.: Relation of Nicotine Acid and Nicotinic Acid Amide to Canine Blacktongue, *J. Am. Chem. Soc.* 59:1767, 1937.
3. Spies, T. D.; Cooper, C.; Blankenhorn, M. A.: The Use of Nicotinic Acid in the Treatment of Pellegra, *J. A. M. A.* 110:622 (Feb. 26) 1938.

## USE OF VITAMINS IN CHRONIC ARTHRITIS

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The evaluation of any therapeutic regime in chronic arthritis is difficult but to evaluate the role of vitamins is doubly difficult because of the various factors involved. It is certain that infection, climate, age, sex, diet and endocrines all play some role in chronic arthritis; the importance of any or all of these factors vary in different individuals and at different times in the same individual. Chronic arthritis seems to be a symptom complex of variable etiology and, unless one considers the disease in this light, it will be impossible to understand the success of one form of therapy in one case and its failure in another.

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The arthritic patient, in general, suffers from nutritional disturbances. Pemberton,<sup>1,2</sup> Fletcher,<sup>3</sup> Sherwood and Thomson<sup>4</sup> have come to the conclusion that the average arthritic diet is inadequate in calories and, as a result, inadequate in certain vitamins. Sherwood and Moore have shown that the arthritic patient's diet is apt to be deficient in protein and phosphorous. Fletcher and Graham,<sup>5</sup> and Gatewood<sup>6</sup> have emphasized the frequency of gastrointestinal complaints in the arthritic patient and have suggested a low carbohydrate diet with increased amounts of vitamin B as a remedy for this condition. It is entirely logical to assume then that a properly regulated diet, that is, a diet which contains sufficient calories with proper proportion of

carbohydrates, proteins and fats with sufficient vitamins, will be beneficial in arthritis. This has, in fact, been found true. An adequate dietary regime improves the well-being of the patient, increases intestinal absorption and motility, encourages the patient and enables him to make a greater effort in his own behalf.

#### VITAMIN A

Vitamin A might seem logically to be the vitamin which should receive the greatest attention in a disease such as arthritis which is considered by many to be of infectious origin.<sup>7</sup> This, however, is not the case and there is little in the literature on the use of vitamin A or its precursors in arthritis. Vitamin A is considered generally to be the anti-infectious vitamin but it has been shown that administration is of no benefit unless a deficiency exists which is extremely rare.<sup>8</sup> The use of vitamin A is not indicated in arthritis unless some coexisting condition has resulted in a deficiency of this fat soluble vitamin.

#### VITAMIN B

Various investigators have pointed out the deficiency of vitamin B in the arthritic diet. Hall and Myers<sup>9</sup> found that the vitamin B content is definitely low. Fletcher and Graham<sup>5</sup> and Gatewood<sup>6</sup> feel that the lack of this vitamin may account for the atonic condition of the colon in arthritis. Steinberg,<sup>10</sup> on the other hand, found a deficiency of vitamin B in the diet of arthritic patients but found that most of the cases in his series suffered from spasticity of the colon which, however, was benefited by the administration of vitamin B. His studies included 118 cases of arthritis, 105 of which were the rheumatoid type and 13 the hypertrophic type. He pointed out the close similarity between patients suffering from vitamin B deficiency not associated with arthritis and those with arthritis. It must be noted, however, that many patients with chronic disease are similarly affected: i. e., anorexia, constipation, faulty assimilation of food, subnormal temperature and the like, which, while perhaps characteristic of a lack of vitamin B, certainly can not be considered a cause of a particular chronic disease but must be considered a result of chronic disease. Keys, Rosenfeld and Tjoflat<sup>11</sup> found vitamin B useful in the treatment of hypertrophic arthritis and they believe that large doses aid in the relief of neuritic pains so often associated with this type of arthritis.

It is my belief that vitamin B is a useful drug in the treatment of arthritis. I believe that it does not have a specific action and is not etiologically responsible for arthritis. One may expect an arthritic patient who has had an inadequate intake of vitamin B to notice an improvement in appetite, general well-being and, if a polyneuritis exists, this may be expected to improve when vitamin B is added to the patient's diet.

Thiamin chloride or B<sub>1</sub> will prove satisfactory for

the relief of the neuritic pains and thrice daily doses of 1 to 5 mgm. by mouth should be adequate. This material may be administered subcutaneously in equivalent doses if oral administration is considered unsatisfactory. For the general effect, however, the B complex should be administered and the dosage will depend entirely upon the potency of the material used. Brewers' yeast, if given in sufficiently large quantities, will prove just as satisfactory as the more expensive concentrates although the latter usually are less disturbing to the patient.

It should be emphasized that vitamin B will not cure arthritis and that patients who can take an adequate amount of the vitamin in their diet need not take the drug. However, vitamin B is the vitamin most often found to be deficient in the diet.

#### VITAMIN C

Vitamin C or ascorbutic acid is a water soluble vitamin which apparently has much to do with maintaining the integrity of the vascular system. In its absence, scurvy develops. Oranges, lemons and tomatoes are rich sources of this material. In true scurvy the joints may be involved and pains in the extremities may be severe. These pains may exist independently of subperiosteal hemorrhage. This condition is not a true arthritis and need not be considered further.

Perla and Marmorston<sup>12</sup> and Faulkner and Taylor<sup>13</sup> have shown that the body is depleted of vitamin C during infection and that much larger amounts of vitamin C than normal are utilized by the body during infections. On the basis of this work, it would seem logical to furnish an increased amount of the vitamin to individuals suffering from chronic infectious arthritis. Rinehart and his co-workers<sup>14, 15, 16, 17, 18, 19</sup> have gone beyond this and suggested that vitamin C deficiency may prepare the soil for the invasion of the body by the agent responsible for rheumatoid arthritis and acute rheumatic fever. They have shown that patients suffering from rheumatoid arthritis have suboptimal amounts of vitamin C in their plasma and they have purported to show that the administration of this vitamin will produce improvement and, if the administration is continued over long periods of time, may prevent relapses and recurrence. They have pointed out that rheumatic fever, at least, tends to occur in the poor, in slums and at the season of the year when we might most reasonably expect a vitamin deficiency to occur. Their experimental work has been confirmed by Schultz<sup>20</sup> and Stimson, Hedley and Rose<sup>21</sup> but the interpretation of some of these workers does not agree with Rinehart. Schultz has pointed out that the lesions seen by Rinehart in his streptococcus infected scurvy guinea pigs are not identical with those of rheumatic fever or rheumatoid arthritis but merely resemble these lesions. It has been pointed out further that similar lesion may be secured in a guinea pig suffering from severe scurvy without infection.



The findings and interpretation of Schultz coincide completely with my experiences with scurvy and infection in guinea pigs.

Clinically, Schultz, Sendroy and Swift<sup>22</sup> have been unable to confirm Rinehart's findings and have stated that vitamin C does not have the ability to shorten the course or prevent attacks of rheumatic fever. Perry<sup>23</sup> came to essentially the same conclusions.

I was unable to influence the course of rheumatoid arthritis by the administration of large doses of vitamin C by mouth or intravenously despite the fact that the blood levels were maintained at optimum levels which exceeded 0.6 mgm. of ascorbutic acid per 100 cc. of blood.

Sendroy and Schultz<sup>24</sup> attempted to study the utilization of vitamin C in rheumatic fever but their results were not conclusive. Sherwood<sup>25</sup> feels that additional vitamin C may be important to the arthritic patient because of the frequency of co-existing infection and because subnormal amounts of vitamin C heighten the tendency to edema and diminish circulation. Hare and Williams<sup>26</sup> point out that adequate amount of vitamin C can be obtained from natural foodstuff and they have proposed a diet of raw fruits and vegetables which, they say, has caused improvement in some arthritic patients.

As far as can be determined at present, vitamin C has no specific effect on chronic arthritis but sufficient quantities should be available, particularly from natural sources, to maintain the blood level at from 0.6 to 0.9 mgm. per 100 cc. of blood or higher. When this level is reached the patient will have a maximum amount of vitamin C in the blood; any surplus will be eliminated in the urine.

I have seen several cases in which the plasma level of vitamin C was low and which did not respond to oral administration of cevatemie acid but did absorb the vitamin when large doses of vitamin B were given with it. It is well to bear in mind that a deficiency of vitamin B may diminish absorption of vitamin C.

#### VITAMIN D

In 1935, Dreyer and Reed<sup>27</sup> reported on the use of massive doses of vitamin D in chronic arthritis. They made this observation coincidental to other work which they had done with large doses of the vitamin and their subsequent observations seemed to confirm their belief that the drug was efficacious. These authors used 500,000 units or more of vitamin D per day and noted no serious side effects. Wyatt, Hicks and Thompson<sup>28</sup> noted improvement of one sort or another in 20 per cent of their series. Their patients received supplemental therapy in the form of calcium and vitamin B. Steck<sup>29</sup> and Farley<sup>30</sup> reported successful results in a series of cases which received adjunct therapy but the studies were not carefully controlled.

In 1938, Abrams and Bauer<sup>31</sup> reported their ob-

servations and reviewed the previous literature critically. Their results were unsatisfactory and they were not impressed with the results of others. Steinberg<sup>32</sup> reported unsatisfactory results from the treatment but pointed out that doses of 150,000 units of vitamin D did not seem to be toxic. Other authors had commented on the toxic reactions, namely, nausea, dizziness and tremor.

My experiences with massive dosage of vitamin D have been most unconvincing and I cannot agree with Steinberg that large doses are not toxic; even 50,000 units will produce nausea and vomiting in some patients and all patients in our series noticed at least transitory toxic symptoms when doses of from 150,000 to 250,000 units were given. The Wisconsin Foundation has never encouraged the use of such high potency vitamin D and the Council of Pharmacy and Chemistry has declared two of the high potency vitamin D products unsuitable for the N. N. R.<sup>33</sup> They point out the dangers of such drugs and note that it has never been shown that the drug is capable of producing results superior to those obtained by other methods.

In summarizing the status of vitamins in arthritis, I feel justified in stating that a specific relationship of vitamins to arthritis has not been proven. It seems wise to assure an adequate intake of all vitamins and to add the concentrated forms only when adequate amounts cannot be administered in the diet. Vitamin B complex will prove useful in a limited number of arthritic cases of both the rheumatoid and degenerative types by improving appetite and perhaps through specific action of B<sub>1</sub> on the nerves in neuritis. Vitamin C can do no harm but its benefits are problematical. The use of tremendous doses of vitamin D should be condemned as being dangerous and without physiological or pharmacological background.

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#### BIBLIOGRAPHY

1. Pemberton, R.: Arthritis and Rheumatoid Conditions, Lea and Febiger, 1935.
2. Pemberton, R.; Pierce, E. G., and Bock, T.: The Relationship of Vitamins to the Dietetic Treatment of Arthritis, *M. J. Rec.* **12**:1, 1933.
3. Fletcher, A. A.: *Canad. M. A. J.* **20**:320, 1930.
4. Sherwood, K. K., and Thomson, Marion E.: Caloric and Vitamin Values in Diet of the Arthritic Patients, *J. Am. Dietet.* **15**:20 (January) 1939.
5. Fletcher, A. A., and Graham, D.: Large Bowel in Chronic Arthritis, *Am. J. M. Sc.* **179**:91 (January) 1930.
6. Gatewood, W. E.: Mechanic of Colon, *Northwest Med.* **29**:1 (January) 1930.
7. Cecil, R. L.: Rheumatoid Arthritis, *J. A. M. A.* **100**:1220 (Apr. 22) 1933.
8. Report of Council on Pharmacy and Chemistry: Status of Certain Questions Concerning Vitamins, *J. A. M. A.* **106**:1732 (May 16) 1936.
9. Hall, L. C., and Myers, W. K.: Diets in Chronic Arthritis, *Arch. Int. Med.* **55**:403 (March) 1935.
10. Steinberg, Charles L.: Vitamin B. Complex Therapy in Chronic Arthritis, *Am. J. Digest. Dis. & Nutrition* **3**:765 (December) 1936.
11. Key, J. A.; Rosenfeld, H. J., and Tjoflat, O. E.: Diagnosis and Treatment of Hyperthropic Arthritis, *J. Missouri M. A.* **35**:159 (May) 1938.
12. Perla, D., and Marmorston, J.: Role of Vitamin C in Resistance, *Arch. Path.* **23**:543 (April) 1937.
13. Faulkner, J. M., and Taylor, F. H.: Vitamin C and Infection, *J. Clin. Investigation* **15**:472, 1936.
14. Rinehart, J. F., and Mettler, S. R.: Heart Valve and Muscles in Experimental Scurvy and Superimposed Infection, *Am. J. Path.* **10**:61, 1934.

15. Rinehart, J. F.; Connors, C. L., and Mettler, S. R.: Further Observations on Pathological Similarity Between Experimental Scurvy Combined With Infection and Rheumatic Fever, *J. Exper. Med.* **59**:97, 1934.

16. Rinehart, J. F.: Studies Relating Vitamin C Deficiency to Rheumatic Fever and Rheumatoid Arthritis, *Ann. Int. Med.* **9**:586, 1935.

17. Rinehart, J. F.; Greenberg, L. D., and Christie, A. A.: Reduced Ascorbic Acid Content of Blood Plasma in Rheumatic Fever, *Proc. Soc. Exper. Biol. & Med.* **35**:350, 1936.

18. Rinehart, J. F.: Vitamin C and Rheumatic Fever, *Internat. Clin.* **2**:22 (June) 1937.

19. Rinehart, J. F.; Greenberg, L. D.; Baker, F.; Mettler, S. R.; Bruckman, F., and Choy, F.: Metabolism of Vitamin C in Rheumatoid Arthritis, *Arch. Int. Med.* **61**:537, 1938.

20. Schultz, M. P.: Cardiovascular and Arthritic Lesions in Guinea Pigs With Chronic Scurvy and Streptococcus Infection, *Arch. Path.* **21**:422, 1936.

21. Stimson, A. M.; Hedley, O. F., and Rose, E.: Notes on Experimental Rheumatic Fever, *Pub. Health Rep.* **49**:361, 1934.

22. Schultz, M. P.; Sendroy, J., and Swift, H. F.: The Significance of Latent Scurvy as an Etiological Factor in Rheumatic Fever, *J. Clin. Investigation* **14**:698, 1935.

23. Perry, C. B.: Rheumatic Heart Disease and Vitamin C, *Lancet* **229**:426, 1935.

24. Sendroy, J., and Schultz, M. P.: Studies of Ascorbic Acid and Rheumatic Fever, *J. Clin. Investigation* **15**:369, 1936.

25. Sherwood, K. K.: Vitamin C and Chronic Arthritis, *Northwest Med.* **37**:288 (September) 1938.

26. Hare, D. C., and Williams, E. C. P.: Vitamin C Output in Diet Treatment of Rheumatoid Arthritis, *Lancet* **1**:20, 1938.

27. Dreyer, I., and Reed, C. I.: The Treatment of Arthritis With Massive Doses of Vitamin D, *Arch. Phys. Therapy* **6**:537, 1935.

28. Wyatt, B. L.; Hicks, R. A., and Thompson, H. E.: Massive Doses of Vitamin D in the Treatment of Proliferative Arthritis, *Ann. Int. Med.* **10**:534, 1936.

29. Steck, Irving E.: Clinical Experiences in Treatment of Arthritis With Massive Doses of Vitamin D, *Illinois M. J.* **7**:243 (March) 1937.

30. Farley, Roger T.: Treatment of Arthritis With Massive Doses of Vitamin D, *J. Am. Inst. Homeop.* **31**:404 (July) 1938.

31. Abrams, N. R., and Bauer, Walter: Treatment of Rheumatoid Arthritis With Large Doses of Vitamin D, *J. A. M. A.* **111**:1632 (Oct. 29) 1938.

32. Steinberg, Charles L.: Massive Doses of Vitamin D in Chronic Arthritis, Its Effect on Calcium Metabolism, *J. Lab. & Clin. Med.* **24**:17 (October) 1938.

33. Report of Council on Pharmacy and Chemistry, *J. A. M. A.* **109**:132 (July 10) 1937.

#### NUMBER OF KIDNEY INJURIES INCREASING

Kidney injuries are increasing, largely due to automobile accidents, George C. Prather, M.D., Boston, and Franklin Farman, M.D., Los Angeles, point out in separate papers published in *The Journal of the American Medical Association* for Jan. 20.

A note of cheer, however, is sounded by Dr. Farman, who says: "At one time the high mortality rate attending these injuries led to pessimism in their ultimate outcome but now recent refinements in diagnosis and improvement in surgical technic have been responsible for a marked reduction in the mortality and the permanent complications resulting from this condition."

Elaborating on the factors involved in the increasing incidence of kidney injuries and pointing out the importance to physicians and surgeons in small communities of keeping informed on advances in handling such conditions, Dr. Prather says: "With the present adult public eager to go places in a hurry and the modern juvenile population actively engaged in individual and scholastic athletics during all months of the year, it is not surprising that the suburban hospital finds patients with kidney injuries among those who are admitted for treatment."

Two instances of crocodile tears or weeping while eating are reported by Lester Allen Russin, M.D., Iowa City, in *The Journal of the American Medical Association* for December 23.

Eight previous cases of this unusual phenomenon have been cited in the medical literature.

## CASE REPORTS

### MULTIPLE FOREIGN BODIES (NINE PIECES OF PEANUT) IN LUNGS OF CHILD AGED 2

WILLIAM A. MARMOR, M.D.,

AND

JAMES W. NOFLES, M.D.

ST. LOUIS

Many unusual cases of single or multiple foreign bodies aspirated into the tracheobronchial tree have been reported, particularly of infants during the second and third years of life and every bronchoscopic clinic records many incidents bringing out the dangers and pitfalls in this hazardous condition. The questions of the diagnosis of radiologically non-opaque foreign bodies in the tracheobronchial tree and the mechanical problems involved in their removal have been discussed by many writers and will not be discussed now. However, one of our cases illustrates so well the many pitfalls of this difficult work that we believe it warrants reporting.

#### REPORT OF CASE

M. B., a colored female, aged 2, was admitted to the Homer G. Phillips Hospital at 11:15 p. m., May 20, 1939, with a history of having a choking spell followed by a severe dyspnea while eating salted peanuts two hours before admittance. When seen in the bronchoscopic department at 2 a. m. the child had a marked dyspnea with rapid labored breathing, dilation of the alae nasi, marked retraction of the supraclavicular and inter-

From the Department of Otolaryngology and Bronchoscopy of the Homer G. Phillips Hospital and The St. Louis University School of Medicine (Dr. Marmor) and Resident Physician in Otolaryngology, Homer G. Phillips Hospital (Dr. Nofles).



Fig. 1. Standard chest plate taken on admission.



costal spaces and the epigastrium on inspiration. There were loud moist rales over both lungs with no demonstrable changes on percussion.

Figure 1 shows the first roentgenogram taken as an emergency at 1 a. m. on which the radiology department was unwilling to make a diagnosis but, based on the severe dyspnea and the definite history, a diagnosis of foreign body and probable multiple foreign bodies in the lungs was made and bronchoscopic examination was advised.

On bronchoscopy at 2 a. m. a relatively small piece of peanut was encountered immediately and was removed without difficulty from the bronchus of the right lower lobe. There was little or no improvement in the breathing and the reintroduction of the bronchoscope showed another piece of peanut which was also removed without difficulty. This procedure was repeated again and again until two half peanuts and three small pieces had been removed from the right lower lobe bronchus and three small pieces had been removed with the suction tube or coughed out making a total of eight pieces removed from the right main bronchus and its primary divisions (fig. 4 A). At the conclusion of the sixth bronchoscopy the child was breathing without difficulty and examination of the remainder of the tracheobronchial tree failed to show any more peanuts. Except for a rapid pulse and marked fatigue the child seemed to be in good condition when returned to the ward.

Approximately fourteen hours after operation the child began to show some restlessness and the house staff made a note that there were some loud moist rales heard over the upper lobe of the left lung. When seen the next morning, approximately thirty hours after operation, the child was again markedly dyspneic and there were no breath sounds heard over the entire left lung while the right lung exhibited harsh vesicular breath sounds throughout.

The standard roentgenograms for cases of suspected nonopaque foreign bodies (end of full inspiration and end of full expiration) were ordered and in spite of the age of the child being only 2 years they show the typical findings of an obstructive emphysema due to a nonopaque foreign body in the left main bronchus (figs. 2 and 3).

On the basis of these findings immediate bronchoscopy was ordered. A 5 mm. bronchoscope was passed

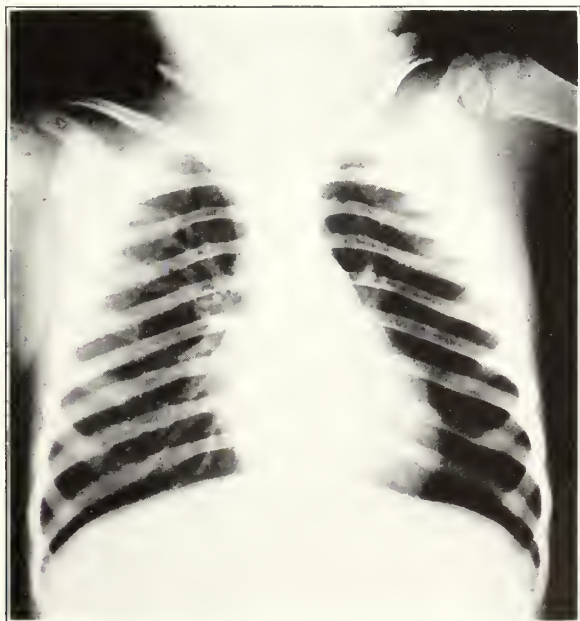


Fig. 2. Taken at the end of a full inspiration.



Fig. 3. Taken at the end of a full expiration shows a restriction of motion and a flattening of the left diaphragm, an emphysema of the left lung and a lateral movement of the mediastinum with respiration. These findings are considered diagnostic of foreign body in the left main bronchus with the ball-valve type of obstruction.

with relatively little difficulty down the left main bronchus and at its extreme end, just at the bifurcation obstructing both the upper and lower lobe bronchi, a full half peanut (fig. 4 B) was encountered. This piece was surrounded by a marked bronchitis and considerable mucopurulent discharge and edematous mucosa. The bronchoscopic appearance was typical of the ball-valve type of obstruction and forceps spaces existed only during the inspiratory phase and, while there was considerable technical difficulty involved, the dislodgment and removal was accomplished without mishap. One more bronchoscopy was done immediately after the removal for the purpose of inspection and suction removal of secretions and the child was returned to the ward in excellent condition.

Approximately five hours after the last bronchoscopy the child again showed labored breathing and another bronchoscopy was done for the purpose of removing secretions. At this time the whole tracheobronchial tree was intensely red and filled with mucopurulent

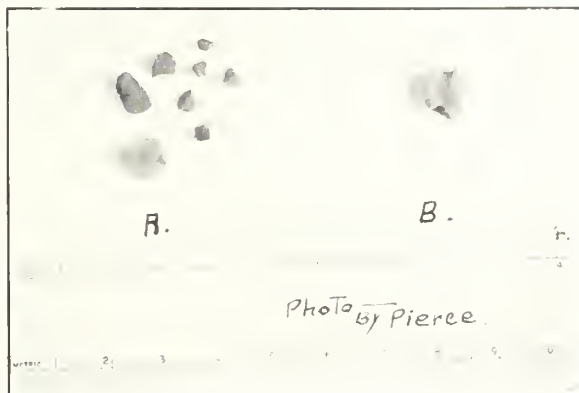


Fig. 4. A. The eight pieces removed from the bronchi of the right lower lobe of the lung at the first sitting. B. The half peanut removed from the left main bronchus at the second operation.

discharge. After the removal of the discharge the child's breathing was much improved and a careful search did not reveal any more peanuts but it was apparent that repeated clearing of the discharge by suction would be necessary so a low tracheotomy was done while the bronchoscope was still in the trachea. A standard Jackson tracheotomy tube was inserted and routine tracheotomy postoperative treatment was instituted.

From this time recovery was uneventful and the child was ready for discharge on the seventeenth hospital day with the tracheotomy tube out and the wound practically healed.

We wish to express our thanks to the radiology department for their excellent cooperation and to Dr. E. Lee Myers who acted as consultant in the handling of this case.

634 North Grand Boulevard.  
Homer G. Phillips Hospital.

## SPECIAL ARTICLES

### HEALTH INSURANCE WITH MEDICAL CARE IN ENGLAND

JEROME E. COOK, M.D.

ST. LOUIS

The panel system of medicine in England is described in a recent book, "Health Insurance With Medical Care," by Douglass W. Orr, M.D., and Jean Waller Orr, with a foreword of approval by David Lloyd George, published by the Macmillan Company. The material in this article comes from this book.

The panel (National Health Insurance, N.H.I.) of England comprises a general practitioner medical service plus a weekly insurance minimum benefit in cash of from \$2.50 to \$3.50 if insured is unable to work. The general practitioner service includes necessary drugs but excludes obstetric care, major surgery, specialist and laboratory service and hospitalization and makes no provision for the family of the insured. The insured pays 10 cents weekly for this insurance, his employer pays a like amount and the state bears the central administrative expense and part (from 15 to 20 per cent) of the disability portion of the payments and the administrative expenses of the "Approved Societies" and "Friendly Societies." The societies "approved" for this function of health insurance "without profit" by the government range in character from outright insurance companies ("Approved Societies") as we know them to organizations such as lodges with insurance benefits and unions with insurance provisions in their charters, the so-called "Friendly Societies." Since the law stipulates only the minimum benefits which these various "societies" must pay, many society may, by selecting their insured membership, secure choice or good risks by various methods such as preliminary examination and exclusion of hazardous occupations and are thus enabled to pay bonuses in some form as cash, nursing service or specialists' services. It

follows that a man working in one of the more hazardous occupations cannot get into an "Approved Society" with rigid admission requirements catering to select risks. The benefits under the system are, therefore, by no means equal for the amount paid in by the insured. From this angle it seems quite undemocratic from the point of view of compulsory, state sponsored and in part state supported insurance. Violent criticism and much strife has occurred as a result of this inequality without as yet having resulted in any corrective measures. Under the "panel" system the insured unit is the employed person, not the family, so that while the breadwinner is given medical and disability benefits the other members of the family have no insurance protection and are in exactly the same status as our clinic or low income type of patient. The number of these uninsured dependents of the low income group is large, exceeding in number those enrolled in the panel. There has been much agitation for enlarging the provisions of the N.H.I. to cover these dependents but financial barriers (increased state expense) is urged against such extension. Meanwhile there is an organized attempt to serve this class of uninsured through a voluntary prepayment plan sponsored by the British Medical Association and administered by the local medical societies. These voluntary plans have been in operation for about six years and now number about 600,000 insured persons. They have had special appeal in the smaller communities although Birmingham with a population of 900,000 has 25,000 enrolled members. This Public Medical Service (P.M.S.) gives the same general type of service as the "panel" and is open only to the dependents of those in the "panel." It does not include obstetrical care, major surgery, expensive drugs such as sera or vaccines or hospitalization and of course pays no disability benefits since its insured are unemployed. There is free choice of physician under the same general arrangement as on the "panel" and the maximum cost for entire family enrollment is 1 shilling (25 cents) a week, individual enrollment being somewhat less. In some localities 80 per cent or more of those eligible are enrolled in this P.M.S. plan.

Despite the various criticisms of the N.H.I. and the plans made to amend it, there is probably general approval on the part of the physicians and the insured. Criticisms seem all in the direction of extending the plan in one or various directions rather than in curtailing or abolishing it. A limited survey of its utilization through a questionnaire revealed that of 110 persons insured in the panel six had never availed themselves of its medical services; thirteen had done so less than once a year; twenty-five had seen their physician once or twice a year; nine had consulted him from six to ten times; thirty-three were indeterminate. It is estimated that a panel physician sees only about 60 per cent of his registered patients each year.



England has in many localities associations like our Group Hospitalization, Inc. They, however, limit membership to income groups eligible to the "panel" but include dependents. They are very popular; in London half the population is enrolled in one or another of the several group hospitalization plans at an annual per capita fee of about \$3.10. In London the group units in the Group Hospital Insurance seem to have established the groundwork for a considerable amount of social life, a sort of National Health Fitness program including bicycling, sports and walks. In general these group hospitalization plans include medical attention in the hospital by the house staff similar to our ward service or attendant staffs but not by any free choice or "panel" physician. Some schemes include medical service of the same sort as in the outpatient department. This seems much like our own clinic service with the registration fee paid by the insurance. Some group hospitalization schemes include roentgen ray and various special services such as visiting home nursing. These additional services, however, entail higher cost which in the more inclusive contracts reach a total of about \$8.50 per annum. A good many workers carry in addition something akin to our ordinary health or disability policies. It seems that there is a good deal of this low premium, low benefit type of "industrial" health insurance in England.

There is also extensive use of visiting nurse service in England, apparently far more than in the United States and the service is country wide. The nursing societies are financed from multiple sources, charitable (including church) donations, municipal and county subsidies, direct payments from patients for services rendered, payments by the N.H.I. societies for nursing services (included as "bonus" features of their contract), similar payments from prepayment hospitalization plans with home nursing provisions. The nurses of these groups do not serve those able to pay private duty fees but apparently function in much the same way as do the nurses of our visiting nurses associations.

There is, of course, the large group of indigent unemployed and unemployable people as in the United States and they are taken care of in much the same way as our own, i.e., by state aid, clinics, charitable and church organizations. Home medical service to this group is usually furnished by a part time salaried physician of the county or municipality. There are 120 such district medical officers in London. School physicians are of about the same status and render services comparable to our own. However they do some direct practice in the specialties such as removing adenoids and tonsils and doing minor surgery. For these services small charges are made when the child's parent is able to pay.

Veneral disease clinics are established under much the same provisions embodied in the recently

passed St. Louis ordinance. Maternal welfare and well baby clinics also resemble our own with one striking exception, i.e., that these voluntary social agencies are frequently given financial aid by local and national tax funds if the public health authorities decide that they are carrying on valuable services.

In making comparisons between English medicine and our own, one must not forget that the one country is small, densely populated and with a citizenry fairly uniform in type and tradition as against the other which is large, in many places thinly populated and with a population of varied background.

The summary of the survey is something to the effect that although the countries (England and the United States) are in many respects different, there are also phases of distinct similarity, i.e., there are undoubted trends toward a general demand for more available and adequate medical care for the less privileged in the community. In England we have at hand an experiment now twenty-five years old directed toward meeting such a demand. Let us study the experiment not as a perfect plan but as a pattern whose good features it may be worth while copying and whose errors both of omission and commission we should strive to avoid; but nevertheless an experiment which has the approval of an overwhelming portion of the English population coming into closest contact with it; namely, the insured and the physicians of the panel. There is no one who advocates abandoning the plan and a return to the previous status. The chief points of criticism and for which correction is being sought may be listed as follows:

1. There is no provision in the N.H.I. for the family of the insured member. The P.M.S. has as yet only very partially filled the gap.

2. The coverage for medical care is incomplete in that it does not provide facilities for modern diagnostic procedures such as laboratory, roentgen ray and specialist consultation.

3. Because of the system of insurance "societies" which can limit enrollment to select risks and thereby offer bonuses, the benefits under the N.H.I. are far from uniform. Privilege rather than need determines the extent of the service.

4. The dependents, the unemployed and other indigents not eligible under N.H.I. present a problem and a challenge to N.H.I. The growing tendency to care for these people under full or part time salaried physicians imperils N.H.I. and the principle of good medical care and free choice of physicians. There is much opinion in favor of including these people as noncontributing members under N.H.I., the entire cost to be met by the state. In fact, some smaller municipalities and counties now pay the fees necessary to include these people in the "panel."

**CANCER CONTROL: EARLY IS THE WORD**

CLARENCE C. LITTLE, Sc.D.,

Managing Director,

AMERICAN SOCIETY FOR THE CONTROL OF CANCER

NEW YORK, N. Y.

Cancer is a curious foe. Second only to heart disease as a killer and most feared of all causes of death, cancer is in its early stages one of the most curable of serious diseases. Its definite diagnosis requires the services of a highly trained pathologist, but early symptoms which may mean the disease is present are recognized easily by any alert individual. Once cancer is diagnosed the preferred treatment is by a group of specialists; yet the key man in the whole field of cancer control is the general practitioner to whom patients go for periodic examinations or for advice about apparently harmless conditions. While late cancer causes considerable suffering, in the early stages it is nearly always painless.

It is fitting that this paradoxical disease should be fought by an Army, not chiefly of men but of women, an Army not of destruction but of education, and its war should be a war to save life. Four years ago a small group of physicians, research workers and club women launched the Women's Field Army of the American Society for the Control of Cancer. Its goal was to reduce cancer mortality and to arouse the interest of men and women everywhere in this disease and the methods and facilities available in their communities for treating and controlling it. Between one third and one half of those who now die could and should be saved by early diagnosis and prompt treatment according to the American Society for the Control of Cancer.

The growth of the Women's Field Army has been rapid. Divisions now exist in forty-six states and cancer information centers, local units of the Army, have been established in more than half the counties of the country. Cancer control is receiving more attention than ever before.

A beginning has been made, but only a beginning in this peacetime war. Approximately 150,000 men, women and children were destroyed by cancer in 1939. The needs in the field are great: more clinics, more funds for research, more facilities for indigent patients and, above all, more education for the general public.

Working under the supervision of physicians and other experts, women are the leaders and organizers of the fight against cancer. However, the most paradoxical thing about this complex disease is that we cannot leave its control to leaders, to research workers or to medical men. Each must all do his bit.

The Field Army suggests three measures that each one may adopt and so play a part in cancer control:

1. Have a comprehensive physical examination once a year however well one feels. Women over 35 years of age should have an examination of the breast and pelvic areas semiannually.

2. Memorize the cancer danger signals, early and usually painless symptoms which may mean that the disease is present and which always should mean a visit to a physician. These are: any persistent lump or thickening, particularly in the breast; any irregular bleeding or discharge from any body opening; any persistent and unexplained indigestion; any sore that does not heal normally, especially about the tongue, mouth or lips; any sudden change in the form or rate of growth of a mole or wart.

3. Enlist in the Women's Field Army in April, set aside by Special Act of Congress as Cancer Control Month, and so help the Army carry on its work of education to save lives.

*Educate, Save, Enlist* are the imperatives of the war against this disease. One more word should be emphasized. The word is *Early*—and *Early Is the Watchword in Cancer Control*.

350 Madison Avenue.

**NEW YORK SESSION OF THE A. M. A.**

"Plans are well under way for one of the greatest annual sessions of the American Medical Association ever held in its history," the Association's *Journal* for February 3 declares in an editorial. "This session is scheduled to take place in New York City June 10-14 inclusive. The meeting places of the various sections will involve the use of the Waldorf-Astoria, the Commodore, the Roosevelt and the Biltmore hotels; registration of Fellows and all the exhibits will be in the Grand Central Palace. The opening meeting will be held in one of the large assembly halls in the same area."

**UNUSUAL SKIN INFECTIONS FROM FUNGI**

The finding and identification of the causative organism of two rather unusual skin infections, both within a comparatively short time, should serve to increase the awareness among the medical profession of the possibility of such diseases, James L. Wade, M.D., Parkersburg, West Virginia, and A. R. K. Matthews, M.D., Rockford, Illinois, declare in *The Journal of the American Medical Association* for February 3.

The two men state that they have been unable to find any other reported examples of infection with the type of fungus they identified. They previously had reported the case of a woman whose breast was infected with *Sporothrix*, an organism resembling the yeast fungi.

In their present report the two doctors describe an infection which occurred on the cheek of a young man who had been tending livestock. Shortly before the two lesions occurred on his cheek he had noticed that some of the sheep under his care had "growths" on their noses. The fungus causing the infection is known as *Mucor*, an organism that forms grayish-white growths, usually called "whiskers," on cold storage meat. Treatment with iodides (compounds of iodine) by mouth and injection into the veins caused the lesions to disappear.



# THE JOURNAL

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MARCH, 1940

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## EDITORIALS

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### THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.
2. The allotment of such funds as the Congress may make available to any state in actual need for the prevention of disease, the promotion of health and the care of the sick on proof of such need.
3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.
4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.
5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.
6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.
7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.
8. Expansion of public health and medical services consistent with the American system of democracy.

### THE JOPLIN SESSION

The Eighty-Third Annual Session of the Missouri State Medical Association will convene in Joplin on April 29, 30 and May 1. All sessions will be held in the Hotel Connor.

An excellent program is being arranged by the Committee on Scientific Work including the following guest speakers: Dr. Heyworth N. Sanford, Chicago, Associate Clinical Professor of Pediatrics, Rush Medical College, University of Chicago; Dr. John H. Musser, New Orleans, Professor of Medicine, Tulane University of Louisiana School of Medicine; Dr. Everett D. Plass, Iowa City, Professor of Obstetrics and Gynecology, State University of Iowa College of Medicine; Dr. Cyrus C. Sturgis, Ann Arbor, Michigan, Professor of Internal Medicine, University of Michigan Medical School; Dr. Joseph W. Gale, Madison, Wisconsin, Associate Professor of Surgery, University of Wisconsin Medical School; Dr. Alfred I. Folsom, Dallas, Texas, Professor of Urology, Baylor University College of Medicine; Dr. Louis A. Buie, Rochester, Minnesota, Professor of Proctology, University of Minnesota Graduate School of Medicine; Dr. John W. Harris, Madison, Wisconsin, Professor of Obstetrics and Gynecology, Wisconsin University Medical School.

Round table discussions will be held at luncheons on Tuesday and Wednesday of the Session.

The Committee on Maternal Welfare and Infant Care will hold its annual meeting Monday noon at a luncheon meeting. Physicians will report problems that have arisen in their practices during the year. Dr. John W. Harris, Madison, Wisconsin, will discuss the cases reported and will present an address at the General Meeting in the afternoon.

The House of Delegates will meet on Monday morning and will reconvene at 4:30 on Monday afternoon. The final session of the House will be held at 4 o'clock on Wednesday. The Council will convene at a luncheon meeting on Monday and at 5 o'clock on Wednesday.

A dinner in honor of Past Presidents will be sponsored by the Council on Monday evening. The legislative program of the Association will be discussed. Dr. James R. McVay, Kansas City, President of the Missouri State Medical Association, will preside. All members and the Auxiliary are invited.

The Jasper County Medical Society will be hosts at a cocktail party, buffet dinner and entertainment for visiting members on Tuesday evening.

The Committee on Hotels for the Session has requested that members plan to combine their reservations whenever possible, two members or more occupying a room. The number of rooms available is approximately 450 and judging by previous attendance and the number of reservations already made for the 1940 session, the Committee feels that it will be necessary for members to combine their reservations in order to accommodate the attendance. A reservation blank appears on page 34 of the advertising section.

The General Committee on Arrangements for the Annual Session is composed of Dr. H. L. Kerr, Cranc, Chairman; Dr. E. P. Heller, Kansas City, and Dr. A. J. Campbell, Sedalia. The local committees follow:

Local Committee on Arrangements: Dr. Paul W. Walker, Joplin, Chairman.

Registration: Dr. Otto T. Blanke, Joplin, Chairman; Drs. M. J. Harris, Carthage, and H. A. LaForce, Joplin.

Hotels: Dr. Sam A. Grantham, Joplin, Chairman; Drs. W. W. Hurst and Irwin T. Craig, Joplin.

Reception: Dr. M. O. Coombs, Joplin, Chairman; Drs. J. L. Sims, Joplin, and Lloyd B. Clinton, Carthage.

Publicity: Dr. M. H. Black, Joplin, Chairman; Drs. J. A. Chenoweth, J. D. Maddox and H. D. McGaughey, Joplin.

Scientific Exhibits: Dr. W. M. Kinney, Joplin, Chairman; Drs. Roy E. Myers, Joplin, and Jesse E. Douglass, Webb City.

Entertainment and Finance: Dr. B. E. De Tar, Joplin, Chairman; Drs. Ed. D. James, Joplin, and E. J. McIntire, Carthage.

#### AMERICAN MEDICAL ASSOCIATION PROPOSES REVISIONS OF HOSPITAL BUILDING BILL

Some desirable clarifications and revisions in the hospital building program bill introduced in the Senate on February 1 by Senator Robert F. Wagner, of New York, are pointed out by *The Journal of the American Medical Association* for February 10. The editorial, however, hails both the bill and the message sent to Congress by the President on the project as a recognition of the local character of most problems of medical need, something which has been lacking in other medical or hospital legislative proposals in recent years.

Particularly important is the suggestion of *The Journal* that more responsibility and control than is provided for in the bill be vested in the national advisory council of leading medical and scientific authorities which would be set up to advise the Surgeon General of the United States Public Health Service in administering the project.

In its discussion of the measure *The Journal* says:

"Here is a new pattern not observable in other medical or hospital legislation introduced in recent years. This measure provides for assisting state, county, health and hospital districts or other political subdivisions; thus it recognizes the local character of most problems in medical service. The total sum involved is relatively small, indicating the experimental nature of the proposal. The third section indicates that communities applying for such hospitals must establish the existence of need. Moreover, these hospitals are to be available to all groups of the population.

"Especially significant is section 4, which establishes a national advisory council to consist of six members, who shall be selected from leading medical or scientific authorities outstanding in matters pertaining to hospitals and other public health services. These six members are to be appointed by the Surgeon General with the approval of the Federal Security Administrator. These offices are largely honorary, since the compensation is \$25 a day and expenses. Their services are wholly advisory, but obviously their opinions are likely to have considerable weight with the officials primarily responsible for carrying out the work. Indeed, the advisory council is charged with considering and recommending to the Surgeon General all applications for funds for building hospitals. It is to formulate standards, review reports and make inspections relative to professional services and the standard of maintenance of the hospital. In this connection the Surgeon General is also authorized, after consultation with the council, to study needs for hospitalization and problems of hospital operation, to approve projects in the hospital field, to provide for training and instruction of personnel, to make inspection and reports on professional services, and to safeguard the quality of service.

"The hospitals are to be leased to the communities in which they are established, the only consideration for the lease being the maintenance and operation of the hospital in accordance with the provisions of the act. It is indicated that the lease may be terminated by the Surgeon General on six months' notice if the hospital fails to comply with the provisions of the Act. Apparently nothing is said as to what will be done with a hospital in case the lease is terminated.

"In section 10, hospitals are authorized to include physical facilities necessary not only for the prevention and diagnosis or treatment of disease but also for protection of the public health. Thus it becomes possible to establish health protecting agencies within the structure of the hospital. The divergence of opinions on the desirability of this integration of public preventive medical services into private or community hospitals demands careful consideration before the final wording is determined.

"Coincidentally, Senator Mead, of New York, introduced into the Senate his bill, S. 3246, to authorize loans for hospitals, water, sewers, stream pollution control, and related projects and facilities. This bill proposes to authorize a federal appropriation of \$300,000,000 for the projects mentioned. It defines a hospital as any institution or facilities for treating illness or disease, including any health, diagnostic or treatment center, station, institution or clinic. This bill also states that not to exceed \$100,000,000 be devoted to the hospital projects. This bill has been referred to the Senate Committee on Banking and Currency, of which Senator Wagner is chairman.



"The Wagner bill was also introduced into the House of Representatives on January 31 by Mr. Lea and referred in that body to the Committee on Interstate and Foreign Commerce. It would seem to any casual observer that only one of these bills is needed to accomplish the President's purpose and that therefore the Wagner bill is the one likely to have much consideration, rather than the Mead bill.

"Obviously this bill, if enacted, will place a tremendous responsibility on the Surgeon General of the United States Public Health Service and the Federal Security Administrator. The location and conduct of these new medical institutions is a matter which will concern greatly not only the public but particularly the medical profession and all who work in the field of the hospital. Perhaps, therefore, it might be better to assign a little larger share of responsibility and control to the Advisory Council. Moreover, the language of the act is somewhat confusing in that certain phrases fail to specify clearly the fact that these clauses apply only to the hospitals to be built under the act and do not concern inspection, training of personnel, or control of hospitals and medical services generally."

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### SULFANILAMIDE

In this day of rapid progress of chemotherapy the chemist is overwhelmed by the number of formulae of theoretical promise, he busies himself preparing many such compounds and studies their physical and chemical properties. The pharmacologist is in turn flooded with compounds for study of absorption, excretion and toxicity. Likewise, the bacteriologist falls heir to these drugs and determines the *in vitro* and experimental efficacy on various microorganisms under varying conditions. Lastly, those having extensive clinical facilities observe the effects of the most promising of these compounds under the best possible circumstances. Even under ideal conditions, adequate data and justified conclusions are not forthcoming on any number of clinical infections in less than several years. In short, the ramifications of this problem of bacterial chemotherapy are endless. In every center of medical research large groups of workers are concentrating on their own particular branch of the problem. Unfortunately, but all too frequently, unjustified conclusions based on insufficient data are published prematurely.

A gigantic task falls on the shoulders of the clinician who endeavors to apply to his practice the everchanging and growing fund of information regarding sulfanilamide and its related compounds.

Fortunately, federal food and drug regulations and American Medical Association Council of Pharmacy and Chemistry serve as a means of protection to both physician and patient. It is entirely illogical to expect a practitioner to have a complete understanding of a field of therapeutics which is currently

confounding the most highly trained investigators.

Only recently the enthusiastic reception of a sulfanilamide solution resulted in a considerable number of fatalities, e.g., the recent unfortunate dissemination of Massengill's Elixir of Sulfanilamide. The literature likewise contains a number of reports of unfavorable side effects and even deaths resulting from the use of sulfanilamide and its derivatives. On the other hand, the duration of illnesses have been shortened and many lives saved by the same chemicals. But until our understanding is more complete, let us not hasten to discard older methods of treatment which have proven successful.

In those cases in which sulfanilamide or its derivatives are used, observations on the course and outcome of the disease should be made carefully and critically. The severity of the disease should warrant the risk of the more serious complications. To safeguard the patient as well as one's self, red and white blood cell counts and urinalyses should be made at intervals of two or three days.

The careful and critical man will be rewarded by having the highest percentage of favorable results as well as the lowest percentage of serious side effects.

It might be wise to use these chemicals sparingly and cautiously being ever mindful of the incompleteness of our understanding of the mode of action, indications, contraindications and complications.

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### MEDICO-MILITARY SYMPOSIUM

The Annual Spring Medico-Military Symposium will be presented in Kansas City, Missouri, March 14 and 15, by the Kansas City Southwest Clinical Society in conjunction with the Seventh Corps Area, United States Army, and Ninth Naval District.

Guest speakers for the medical section include Dr. A. I. Folsom, Professor of Urology, Baylor University College of Medicine, Dallas; Dr. Frederick A. Jostes, Chief of Orthopedic Service, St. Louis County Hospital, St. Louis; Dr. Ralph A. Kinsella, Professor of Internal Medicine, St. Louis University School of Medicine, St. Louis; Dr. H. Winnett Orr, Chief Surgeon, Orthopedic Department, Lincoln General Hospital, Lincoln, Nebraska, and Dr. A. A. Zierold, Professor of Surgery, University of Minnesota Medical School, Minneapolis. The military section of the program will have several guest speakers.

Physicians, whether members of the medical reserve corps or not, are invited to attend this meeting. Members of the reserve corps will receive credits for registering and attending the meeting. Registration is complimentary.

The Kansas City Academy of Medicine will hold its fiftieth anniversary dinner on Friday evening, March 15. Dr. Allen O. Whipple, Valentine Mott

Professor of Surgery, Columbia University, College of Physicians and Surgeons, New York City, will be the guest speaker.

#### NORTH CAROLINA MEDICAL JOURNAL

On January 1, 1940, the first issue of the *North Carolina Medical Journal* was issued. It is the official publication of the Medical Society of the State of North Carolina. An editorial in the first issue states that "the mission of the *North Carolina Medical Journal* is to serve as a medium for North Carolina doctors to use in exchanging ideas; as a purveyor of worth while medical information, whether from our own members or from guest speakers and writers; as a means of contact between the president, the secretary and other officers and members of the society; as a permanent record of research by society members, and as a news letter about the interesting doings of North Carolina doctors."

Dr. Wingate M. Johnson, Winston-Salem, is editor, and is to be assisted by an editorial board.

The January issue carries greetings and congratulations from Dr. Rock Sleyster, Wauwatosa, Wisconsin, President of the American Medical Association; Dr. Morris Fishbein, Chicago, Editor of the *Journal of the American Medical Association*; Dr. Nathan B. Van Etten, New York, President-Elect of the American Medical Association, and Dr. Olin West, Chicago, Secretary of the American Medical Association. The Missouri State Medical Association adds its congratulations to these.

#### NEWS NOTES

Dr. Martin Glaser, St. Louis, was appointed by the Board of Aldermen of St. Louis as coroner on January 26 to succeed Dr. Louis R. Padberg, deceased.

The following speakers appeared on the program of the Trudeau Club of St. Louis on February 1: Drs. Evarts A. Graham, Alfred Goldman, Brian Blades, Robert Elliott and Dan Myers, St. Louis.

The following officers for 1940 were elected by the Kansas City Association of Railway and Industrial Physicians and Surgeons: President, Dr. C. C. Nesselrode; vice president, Dr. R. R. Myers; secretary, Dr. Frank L. Feierabend, and treasurer, Dr. Carl Lindquist.

Dr. V. V. Wood, St. Louis, was the guest of Dr. Homer D. Junkin, Paris, Illinois, at a meeting of the staff of the Paris Hospital and invited guests at Hotel France, February 8, at Paris, Illinois. Dr. Wood spoke on "Some Common Ear, Nose and Throat Conditions the General Practitioner Should Be Able to Diagnose and Treat."

Dr. Dudley S. Conley, Columbia, appeared on the program of the fifth assembly of the United States Chapter of the International College of Surgeons at Venice, Florida, February 11 to 14.

Dr. G. V. Stryker, St. Louis, was a guest of the Jackson County (Illinois) Medical Society at Carbondale, Illinois, on February 15 and spoke on "Ringworm Infections of the Skin."

The American Association of Obstetricians, Gynecologists and Abdominal Surgeons is offering "The Foundation Prize" of \$150 for the best thesis of not over 5000 words which must be submitted before June 1. Information may be obtained from Dr. James R. Bloss, Secretary, 418 Eleventh Street, Huntington, West Virginia.

The Joint Committee on Health Problems in Education of the National Education Association of the United States and the American Medical Association presented a symposium on "How Can Education Improve the Nation's Health" in St. Louis on February 28. Speakers were Mr. Alexander J. Stoddard, Superintendent of Schools, Philadelphia; Dr. W. W. Bauer, Chicago, Director of the Bureau of Health Education of the American Medical Association; Dr. Walter H. Brown, Palo Alto, California, Stanford University, and Dr. John W. Studebaker, United States Commissioner of Education.

Several physicians in southeast Missouri have reported being visited by a man requesting treatment for an inflamed blind right eye and future obstetrical care for his wife. He carried samples of sweet potatoes which he offered for sale. Usually he stated that he needed "medicine to relieve the pain" until he could reach a distant hospital where the eye was to be removed. In some cases he stated that he needed money to finance the trip to the hospital or money to repair a punctured tire. Fictitious addresses were given and the potatoes were never delivered. The inflammation of the eye appeared to be self induced.

The Eighth Pan-American Scientific Congress will be held in Washington, D.C., May 10 to 18, under the auspices of the government of the United States. By a special act of Congress invitations have been extended to the governments of the American republics which are members of the Pan-American Union. April 14, 1940, marks the fiftieth anniversary of the founding of the Union. Other inter-American meetings serving as a medium for the exchange of scientific information have been held in Buenos Aires in 1898, in Montevideo in 1901, in Rio de Janeiro in 1905, in Chile in 1908 (the first in which the United States was invited to participate), in Washington, D.C., in 1915,



in Lima in 1925, in Mexico City in 1935. The Congress is divided into eleven sections, one of which is on "Public Health and Medicine."

Drs. Curtis H. Lohr and Frank R. Bradley, St. Louis, appeared on the program of the Hospital Conference of the American College of Surgeons' Sectional Meeting in New Orleans, January 17 to 19.

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Nonofficial Remedies:

Abbott Laboratories

Mixed Grass Concentrated Pollen Extract—Abbott (Blue Grass, Orchard Grass, Timothy Red Top, and Sweet Vernal Grass, in equal parts)

Barry Allergy Laboratory, Inc.

Grass Mixture (Spring) Pollen Extract—Barry  
Ragweed Pollen Extract—Barry

Mallinckrodt Chemical Works

Theobromine and Sodium Acetate—Mallinckrodt  
Parke Davis & Company

Antipneumococcic Serum (Felton) Type I, Refined and Concentrated, 20,000 unit ambot package

Antipneumococcic Serum (Felton) Type I, Refined and Concentrated, 50,000 unit ambot package

Antipneumococcic Serum (Felton) Types I and II, Refined and Concentrated, 20,000 unit ambot package

Antipneumococcic Serum (Felton) Types I and II, Refined and Concentrated, 50,000 unit ambot package

Antipneumococcic Serum (Felton) Type II, Refined and Concentrated, 20,000 unit ambot package

Antipneumococcic Serum (Felton) Type II, Refined and Concentrated, 50,000 unit ambot package

The Smith-Dorsey Company

Emulsion Liquid Petrolatum, Chocolate Flavored  
Emulsion Liquid Petrolatum with 1½ grains Phenolphthalein per fluid ounce, Chocolate Flavored

Emulsion Liquid Petrolatum with 5 grains Phenolphthalein per fluid ounce, Chocolate Flavored

Frederick Stearns & Company

Thiamin Chloride Tablets—Stearns, 1.0 mg.

The Upjohn Company

Ampoules Mercuric Salicylate, 0.065 Gm. (1 grain), 1 cc.

Ampoules Mercury Succinimide, 0.2 Gm. (13 grain) 1 cc.

Ampoule Solution Quinine and Urea Hydrochloride, 0.5 Gm. (7½ grains) 1½ cc.

## ORGANIZATION ACTIVITIES

### MESSAGE OF PRESIDENT ROOSEVELT ON CONSTRUCTION OF HOSPITALS IN NEEDY AREAS AND TEXT OF WAGNER BILL

Following is a copy of a message from the President to the Congress of the United States (House Document 604; *Congressional Record*, January 30). Following the receipt of the message, Senator Wagner, on behalf of himself and Senator George of Georgia introduced Senate Bill 3230 "to promote the national health and welfare through appropriation of funds for the construction of hospitals," which was referred to the Senate Committee on Education and Labor. Representative Lea, of California, introduced a companion bill in the House of Representatives, H. R. 8240, which was referred to the House Committee on Interstate and Foreign Commerce.

#### The President's Message

*To the Congress of the United States:*

In my special message to the Congress on January 23, 1939, I expressed my concern over the inequalities that exist among the states as to health services and resources with which to furnish such services. With that message I transmitted the report and recommendations on national health prepared by the Interdepartmental Committee to Coordinate Health and Welfare Activities and recommended it for careful study by the Congress.

Conditions described a year ago are substantially unchanged today. There is still need for the federal government to participate in strengthening and increasing the health security of the nation. Therefore, I am glad to know that a committee of the Congress has already begun a careful study of health legislation. It is my hope that such study will be continued actively during the present session, looking toward constructive action at the next. I have asked the Interdepartmental Committee to Coordinate Health and Welfare Activities to continue its studies.

In order that at least a beginning may be made I now propose for the consideration of the Congress a program for the construction of small hospitals in needy areas of the country, especially in rural areas, not now provided with them. Hospitals are essential to physicians in giving modern medical service to the people. In many areas present hospital facilities are almost nonexistent. The most elementary health needs are not being met.

The provision of hospitals in the areas to which I refer will greatly improve existing health services, attract competent doctors and raise the standards of medical care in these communities. The new hospitals should serve the additional purpose of providing laboratory and other diagnostic facilities for the use of local physicians, as well as accommodations for local health departments.

The proposed hospitals should be built only where they are most needed; they should not be constructed in communities where public or private institutions are already available to the people in need of service even if these institutions are not up to the highest standards. To insure proper location and good standards of operation, approval of hospital construction projects should be given by the Surgeon General of the Public Health Service, with the advice of an advisory council consist-

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ing of outstanding medical and scientific authorities who are expert in matters relating to hospital and other public health services.

Projects proposed for consideration should be submitted by responsible public authorities and should include assurance that adequate maintenance will be provided. Approval of projects should be preceded by careful survey of existing local hospital facilities and needs. Standards for organization, staff and continuing operation should be established by the Surgeon General, with the advice of the advisory council. A competent hospital staff and satisfactory standards of service should be required, including medical, surgical and maternity service. When indicated, special provisions should be made for the care of the tuberculous. In many areas of the South, the present acute needs for the care of Negro patients should also be met.

I suggest that these hospitals be simple, functional structures, utilizing inexpensive materials and construction methods. The facilities of the Federal Works Agency should be utilized in the planning and execution of the hospital projects. Title to these institutions should be held by the federal government, but operation should be a local financial responsibility.

I recommend to the Congress that enabling legislation for this program be enacted and that a sum of between \$7,500,000 and \$10,000,000 be appropriated to the Public Health Service to inaugurate the program during the next fiscal year.

I am confident that even this limited undertaking will bring substantial returns in the saving of lives, rehabilitation of workers, and increased health and vigor of the people.

This suggestion is not a renewal of a Public Works program through the method of grants in aid. The areas which I have in mind are areas so poor that they cannot raise their share of the cost of building and equipping a hospital. Yet I believe that many of such communities have enough public-spirited citizens with means, and enough citizens able to pay something for hospital treatment, to care for operating costs of a hospital, provided they do not have to pay for its original construction and equipment, or to pay annual interest and amortization on borrowed money. Treatment in such a hospital would, of course, be available to men, women and children who literally can afford to contribute little or nothing toward their treatment.

One of the important difficulties in such areas at the present time is that young doctors hesitate to practice general medicine or surgery because of the utter lack of hospital or laboratory facilities. One cannot blame them.

In such areas also costs of construction are generally low and many local materials can be used. It is my belief that with the assistance of the Work Projects Administration the cost of building and equipping a hundred bed hospital can be kept down to between \$150,000 and \$200,000. This means that we could build fifty such hospitals for between \$7,500,000 and \$10,000,000.

This is not an ambitious project. This principle should not be extended to government gifts to communities which are financially able to build their own hospitals. It is an experiment in the sense that the nation will gain much experience by undertaking such a project.

At the very least it will save lives and improve health in those parts of the nation which need this most and can afford it least.

FRANKLIN D. ROOSEVELT

The White House,  
January 30, 1940.

#### Text of S. 3230. Introduced by Senator Wagner

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Hospital Act of 1940."*

SEC. 2. For the purpose of assisting states, counties, health or hospital districts, and other political subdivisions of the states in providing better health and medical services through the provision of needed hospital facilities to serve rural communities and economically depressed areas, there is hereby authorized to be appropriated to the Public Health Service for the fiscal year ending June 30, 1941, the sum of \$10,000,000 and for each fiscal year thereafter such sums as the Congress may deem necessary for carrying out the purposes of this act. Amounts appropriated under this act shall be available until expended.

SEC. 3. States, counties, cities, other political subdivisions or parts thereof alone or in combination wishing to participate in the benefits contemplated by this act shall make application to the Surgeon General of the Public Health Service (hereinafter referred to as the Surgeon General). Said applications shall contain information necessary to establish the existence of need for hospitals, to give assurance acceptable to the Surgeon General that such hospitals will be made available under appropriate conditions to all groups of the population, will be maintained in good repair, and will be utilized in furnishing service of satisfactory quality, in accordance with regulations hereinafter authorized to be prescribed.

SEC. 4. There is hereby established the National Advisory Hospital Council (hereinafter referred to as the "Council") to consist of the Surgeon General as chairman and six members to be appointed by the Surgeon General with the approval of the Federal Security Administrator. The six appointed members shall be selected from leading medical or scientific authorities who are outstanding in matters pertaining to hospitals and other public health services. Each appointed member shall hold office for a term of three years except that (1) any member appointed to fill a vacancy occurring prior to the expiration of the term for which his predecessor was appointed shall be appointed for the remainder of such term, and (2) the terms of office of the members first taking office shall expire, as designated by the Surgeon General at the time of appointment, two at the end of the first year, two at the end of the second year, and two at the end of the third year after the date of the first meeting of the Council. No appointed member shall be eligible to serve continuously for more than three years but shall be eligible for reappointment if he has not served as a member of the Council at any time within twelve months immediately preceding his reappointment. Each appointed member shall receive compensation at the rate of \$25 per day during the time spent in attending meetings of the Council and for the time devoted to official business of the Council under this act, and actual and necessary traveling and subsistence expenses while away from his place of residence upon official business under this act.

SEC. 5. The Council is authorized to advise the Surgeon General with reference to the carrying out of the provisions of this act, including—

(a) The review of applications for hospitals submitted in accordance with and meeting the requirements of section 2 and recommendation of such projects as in its opinion are needed, will be adequately maintained, and otherwise will fulfill the requirements of this act;

(b) The formulation of standards which are necessary to insure proper conduct of the hospitals and care of persons served by the hospitals;

(c) The formulation of rules and regulations necessary to carry out the provisions of this act;

(d) The review of reports and inspections and, when necessary, the making of inspections with reference to professional service and standards of maintenance of the hospitals.

SEC. 6. In carrying out the purposes of this act, the



Surgeon General is authorized and directed, after consultation with the Council—

(a) To conduct, assist and foster studies and surveys with respect to needs for hospitalization and problems of hospital operation;

(b) To approve hospital projects, to designate the location, type, equipment and size of hospitals, and to allocate available funds to such approved projects;

(c) To provide training and instruction of personnel who will be required in connection with the hospitals;

(d) To cooperate with state and local health and welfare authorities and with professional agencies;

(e) To secure reports and to make inspections with respect to professional service and standards of maintenance of the hospitals and other matters pertinent to carrying out the purposes of this act;

(f) To adopt such additional means as may be found necessary or appropriate to carry out the provisions of this act, including the safeguarding of the quality of service furnished in hospitals;

(g) To make, with the approval of the Federal Security Administrator, such rules and regulations as may be necessary to carry out the provisions of this act;

(h) To lease hospital projects, when completed, to the applicant for an indefinite period, the consideration for such lease being the maintenance and operation of said hospital in accordance with the provisions of this act. If at any time said maintenance and operation by the applicant shall fail to meet such provisions, the lease shall be terminated by the Surgeon General on six months' notice.

Sec. 7. When a hospital project has been approved by the Surgeon General, in accordance with the provisions of this act, it shall be certified by the Federal Security Administrator to the Federal Works Agency for construction and there shall be allocated and transferred to the Federal Works Agency, out of funds appropriated pursuant to this act, so much of the appropriation as may be determined to be available for the project, and the Federal Works Agency is authorized to expend such sums for the planning, execution and construction of the project and pertinent facilities, including administrative expenses, site acquisition, the preparation of working drawings and specifications, award of all necessary contracts and supervision of construction; and the Federal Works Agency is further authorized to expend out of appropriations available to it, in accordance with the purposes thereof, such sums as may be necessary for the completion of the project but without regard to specific limitations imposed on the use thereof. Title to the properties so constructed, and to the equipment installed therein, and to the land on which they are located, shall be in the United States.

Sec. 8. The Federal Security Administrator is authorized to accept on behalf of the United States gifts of money, equipment and land to be utilized in carrying out the purposes of this act.

Sec. 9. The President is authorized to allocate from funds appropriated pursuant to this act, for the fiscal year ending June 30, 1941, a sum for all necessary expenses of the Public Health Service in administering the provisions of this act, including the training of personnel; and there is hereby authorized to be appropriated in each succeeding fiscal year such amounts as the Congress may deem necessary for such purpose.

Sec. 10. (a) There is hereby authorized to be appointed in the Public Health Service, in accordance with applicable law, such additional commissioned officers and other personnel as may be necessary in carrying out the provisions of this act.

(b) On recommendation of the Surgeon General, the Federal Security Administrator shall submit to the Bureau of the Budget on or before September 15 of each year a list of approved hospital projects under this act and cost estimates thereof, together with such other data as may be necessary for the preparation of the budget estimates.

(c) This act shall not be construed as superseding or limiting (1) the functions, under any other act, of the Public Health Service or any other agency of the United States relating to the prevention, diagnosis and treatment of disease; or (2) the expenditure of money therefor.

(d) The term "state" as used in this act shall include also the territories and insular possessions of the United States.

(e) The term "hospital" as used in this act shall include the physical facilities necessary for the prevention, diagnosis or treatment of disease, and for the protection of the public health.

(f) The Surgeon General shall include in his annual report for transmission to Congress a full report of the administration of the act, including a detailed statement of receipts and disbursements.

(g) This act shall take effect thirty days after the date of its enactment.

#### ANALYSIS OF S. 3246

S. 3246 is a bill to authorize loans for hospitals, water, sewer stream-pollution control and related projects and facilities. The following analysis was prepared by the Bureau of Legal Medicine and Legislation of the American Medical Association and appears in *The Journal of the American Medical Association* of February 10.

This bill was introduced by Senator Mead of New York, February 1. It proposes to authorize a federal appropriation of \$300,000,000 to remain available until expended to be utilized in making loans to public bodies and nonprofit organizations to finance the construction, equipment, repair, alteration, extension, improvement and "the temporary operation and maintenance for a period not exceeding four years" of: (1) hospitals defined to mean any institutions or facilities for the treatment of illness or disease, including any health, diagnostic or treatment center, station, institution or clinic; (2) water and sewerage works and systems, including treatment plants and any and all constituent facilities thereof; (3) works and systems for the reduction of pollution in streams, and (4) related "facilities" necessary or proper to safeguarding the health of the people, where, in the determination of the Administrator of the Federal Works Agency, such "facilities" are now inadequate or nonexistent. (The bill is silent as to what is to be considered a "related facility.")

Of the sum to be authorized, not to exceed \$100,000,000 may be devoted to hospital projects and not to exceed \$9,000,000 will be made available during the fiscal year ending June 30, 1941, for administrative purposes in carrying out the provisions of the bill.

The bill contemplates that secured loans may be made by the Administrator of the Federal Works Agency to any public body, defined to mean any state, territory, possession or political subdivision, or an instrumentality or agency thereof, and to any organization not operating for profit, and created pursuant to law or under the authority of any public body. Loans will be repayable within

a period not to exceed fifty years and will bear interest at the rate of 2 per cent a year.

With particular reference to hospitals, the bill provides that, to the extent not inconsistent with any pertinent state or territorial law, any public body or nonprofit organization receiving a loan for the construction of a hospital or a hospital addition shall, on the request of the Surgeon General of the Public Health Service, make such hospital or hospital addition available to the federal government for operation by it during (1) a state of war or (2) a "national emergency," the public body or nonprofit organization to be compensated therefor in such an amount as the Congress shall determine to be just and reasonable. The bill does not define what shall constitute a "national emergency" nor does it indicate who is to determine the existence of an emergency so as to justify the Surgeon General of the Public Health Service in taking over the operation of a hospital or addition constructed with money made available by the bill.

The bill provides that it may be cited as the "Health Security Act of 1940." The administration of its provisions, however, is to be developed solely, with the exception noted in the preceding paragraph, on the administrator of the Federal Works Agency, who will be authorized to prescribe the terms and conditions on which loans may be made. While it relates to health security, it has been referred to the Senate Committee on Banking and Currency, of which Senator Wagner, of New York, is chairman and who himself on February 1 introduced another bill providing for the construction of hospitals, discussed elsewhere in this issue,<sup>1</sup> which bill was referred to the Senate Committee on Education and Labor.

In submitting S. 3246, its author, Senator Mead, said in part:

"I wish to observe at the outset that my bill will in no wise conflict with a similar bill introduced by my distinguished colleague, the senior Senator from New York (Mr. Wagner). It will supplement the program he proposes, and it will permit applicants who otherwise would not be permitted to apply for funds for this purpose to qualify and, in the end, to build hospital facilities." (*Congressional Record*, Feb. 1, 1940, page 1361.)

Representative Schulte, of Indiana, has introduced a companion bill in the House of Representatives, H. R. 8288, which was referred to the House Committee on Appropriations.

1. Material on the Wagner Bill appears on page 124.

### THE PHYSICIAN'S FEDERAL INCOME TAX—1940

The Revenue Act of 1939 effected no change in the federal income tax laws of particular interest to physicians, as such. Another law, however, the Public Salary Tax Act of 1939, will subject to the

federal income tax laws the income derived from personal services rendered by a physician as an officer or employee of a state, political subdivision, or any agency or instrumentality of either. Heretofore such income has been considered nontaxable under the federal income tax laws if received for services rendered in carrying out a governmental function. Furthermore, the federal government consented to the taxation by states or local taxing authorities of compensation received after December 31, 1938, for personal services as an officer or employee of the United States, any territory or possession or political subdivision, the District of Columbia or any agency or instrumentality of any one or more of the foregoing, if such taxation does not discriminate against such officer or employee because of the source of such compensation. This act, in effect, does away with the immunity from federal income taxes heretofore accorded employees of states, their political subdivisions, agencies or instrumentalities and the immunity from state and local taxes of the income received by federal officers or employees.

Every one who is required to make a federal income tax return must do so on or before March 15, unless an extension of time for filing his return has been granted. For cause shown, the collector of internal revenue for the district in which the taxpayer files his return may grant such an extension, on application filed with him by the taxpayer. This application must state fully the causes for the delay. Failure to make a return may subject the taxpayer to a penalty of 25 per cent of the amount of the tax due.

The normal rate of tax on residents of the United States and on all citizens of the United States regardless of their places of residence is 4 per cent on net income in excess of the exemptions and credits.

#### WHO MUST FILE RETURNS

1. If gross income was less than \$5,000 during 1939, a return must be filed (a) by every unmarried person, and by every married person not living with her husband or his wife, whose net income was \$1,000 or more, and (b) by every married person living with her husband or his wife, whose net income was \$2,500 or more. If the aggregate net income of husband and wife, living together, was \$2,500 or more, each may make a return or the two may unite in a joint return.

2. Returns must be filed by every person whose gross income in 1939 was \$5,000 or more, regardless of the amount of his net income and of his marital status. If the aggregate gross income of husband and wife, living together, was \$5,000 or more, they must file either a joint return or separate returns, regardless of the amounts of their joint or individual net incomes.

If the status of a taxpayer, so far as it affects the personal exemption or credit for dependents, changed during the year, the personal exemption and credit must be apportioned, under rules and

Prepared by the Bureau of Legal Medicine and Legislation of the American Medical Association.



regulations prescribed by the Commissioner of Internal Revenue with the approval of the Secretary of the Treasury, in accordance with the number of months before and after such change. For the purpose of such apportionment a fractional part of a month should be disregarded unless it amounts to more than half a month, in which case it is to be considered as a month.

As a matter of courtesy only, blanks for returns are sent to taxpayers by the collectors of internal revenue, without request. Failure to receive a blank does not excuse any one from making a return: the taxpayer should obtain the necessary blank from the local collector of internal revenue.

The following discussion covers only matters relating specifically to physicians. Full information concerning questions of general interest may be obtained from the official return blank and from the collectors of internal revenue.

#### GROSS AND NET INCOMES: WHAT THEY ARE

**Gross Income.**—A physician's gross income is the total amount of money received by him during the year for professional services, regardless of the time when the services were rendered for which the money was paid, plus such money as he has received as profits from investments and speculation and as compensation and profits from other sources.

**Net Income.**—Certain professional expenses and the expenses of carrying on any enterprise in which the physician may be engaged for gain may be subtracted as "deductions" from the gross income, to determine the net income on which the tax is to be paid. An "exemption" is allowed, the amount depending on the taxpayer's marital status during the tax year as stated before. These matters are fully covered in the instructions on the tax return blanks.

**Earned Income.**—In computing the normal tax, but not the surtax, there may be subtracted from net income from all sources an amount equal to 10 per cent of the earned net income, except that the amount so subtracted shall in no case exceed 10 per cent of the net income from all sources. Earned income means professional fees, salaries and wages received as compensation for personal services, as distinguished from receipts from other sources.

The first \$3,000 of a physician's net income from all sources may be regarded under the law as earned net income, whether it was or was not in fact earned within the meaning set forth in the preceding paragraph. Net income in excess of \$3,000 may not be claimed as earned unless it in fact comes within that category. No physician may claim as earned net income any income in excess of \$14,000.

#### DEDUCTIONS FOR PROFESSIONAL EXPENSES

A physician is entitled to deduct all current expenses necessary in carrying on his practice. The

taxpayer should make no claim for the deduction of expenses unless he is prepared to prove the expenditure by competent evidence. So far as practicable, accurate itemized records should be kept of expenses and substantiating evidence should be carefully preserved. The following statement shows what such deductible expenses are and how they are to be computed:

**Office Rent.**—Office rent is deductible. If a physician rents an office for professional purposes alone, the entire rent may be deducted. If he rents a building or apartment for use as a residence as well as for office purposes, he may deduct a part of the rental fairly proportionate to the amount of space used for professional purposes. If the physician occasionally sees a patient in his dwelling house or apartment, he may not, however, deduct any part of the rent of such house or apartment as professional expense; to entitle him to such a deduction he must have an office there, with regular office hours. If a physician owns the building in which his office is located, he cannot charge himself with "rent" and deduct the amount so charged.

**Office Maintenance.**—Expenditures for office maintenance, as for heating, lighting, telephone service and the services of attendants, are deductible.

**Supplies.**—Payments for supplies for professional use are deductible. Supplies may be fairly described as articles consumed in the using; for instance, dressings, clinical thermometers, drugs and chemicals. Professional journals may be classified as supplies and the subscription price deducted. Amounts currently expended for books, furniture and professional instruments and equipment, "the useful life of which is short," generally less than one year, may be deducted; but, if such articles have a more or less permanent value, their purchase price is a capital expenditure and is not deductible.

**Equipment.**—Equipment comprises property of a more or less permanent nature. It may ultimately wear out, deteriorate or become obsolete, but it is not in the ordinary sense of the word "consumed in the using."

The cost of equipment, such as has been described, for professional use, cannot be deducted as expense in the year acquired. Examples of this class of property are automobiles, office furniture, medical, surgical and laboratory equipment of more or less permanent nature, and instruments and appliances constituting a part of the physician's professional outfit, to be used over a considerable period of time, generally over one year. Books of more or less permanent nature are regarded as equipment and the purchase price is therefore not deductible.

Although the cost of such equipment is not deductible in the year acquired, nevertheless it may be recovered through depreciation reductions taken year by year over its useful life, as described later.

No hard and fast rule can be laid down as to

what part of the cost of equipment is deductible each year as depreciation. The amount depends to some extent on the nature of the property and on the extent and character of its use. The length of its useful life should be the primary consideration. The most that can be done is to suggest certain average or normal rates of depreciation for each of several classes of articles and to leave to the taxpayer the modification of the suggested rates as the circumstances of his particular case may dictate. As fair, normal or average rates of depreciation, the following have been suggested: automobiles, 25 per cent a year; ordinary medical libraries, x-ray equipment, physical therapy equipment, electrical sterilizers, surgical instruments and diagnostic apparatus, 10 per cent a year; office furniture, 5 per cent a year.

The principle governing the determination of all rates of depreciation is that the total amount claimed by the taxpayer as depreciation during the life of the article, plus the salvage value of the article at the end of its useful life, shall not be greater than its purchase price or, if purchased before March 1913, either its fair market value as of that date or its original cost, whichever may be greater. The physician must in good faith use his best judgment and claim only such allowance for depreciation as the facts justify. The estimate of useful life, on which the rate of depreciation is based, should be carefully considered in his individual case.

In a Treasury Decision, approved February 28, 1934, No. 4422, it was held, among other things, that:

1. The cost to be recovered shall be charged off over the useful life of the property.
2. The reasonableness of any claim for depreciation shall be determined on the conditions known to exist at the end of the period for which the return was made.
3. Where the cost or other basis of the property has been recovered through depreciation or other allowances, no further deduction for depreciation shall be allowed.
4. The burden of proof will rest on the taxpayer to sustain the deduction claimed.
5. The deduction for depreciation in respect to any depreciable property for any taxable year shall be limited to such ratable amount as may reasonably be considered necessary to recover during the remaining life of the property the unrecovered cost or other basis.

Particular attention is called to the last of the foregoing provisions. If, in prior years, rates have been claimed which, if continued, will fully depreciate the cost, less salvage, before the end of its useful life, based on conditions now known, a reestimate of the remaining useful life should now be made and the portion of the cost that had not been depreciated at the beginning of the year 1939 (for a return for the year 1939) should be spread over this reestimated life.

*Medical Dues.*—Dues paid to societies of a strictly professional character are deductible. Dues paid to social organizations, even though their membership is limited to physicians, are personal expenses and not deductible.

*Postgraduate Study.*—The Commissioner of Internal Revenue holds that the expense of postgraduate study is not deductible.

*Traveling Expenses.*—Traveling expenses, including amounts paid for transportation, meals and lodging, necessarily incurred in professional visits to patients and in attending medical meetings for a professional purpose, are deductible.

*Automobiles.*—Payment for an automobile is a payment for permanent equipment and is not deductible. The cost of operation and repair, and loss through depreciation, are deductible. The cost of operation and repair includes the cost of gasoline, oil, tires, insurance, repairs, garage rental (when the garage is not owned by the physician), chauffeurs' wages, and the like.

Deductible loss through depreciation of an automobile is the actual diminution in value resulting from obsolescence and use and from accidental injury against which the physician is not insured. If depreciation is computed on the basis of the average loss during a series of years, the series must extend over the entire estimated life of the car, not merely over the period in which the car is in the possession of the present taxpayer.

If an automobile is used for professional and also for personal purposes—as when used by the physician partly for recreation, or so used by his family—only so much of the expense as arises out of the use for professional purposes may be deducted. A physician doing an exclusive office practice and using his car merely to go to and from his office cannot deduct depreciation or operating expenses; he is regarded as using his car for his personal convenience and not as a means of gaining a livelihood.

What has been said in respect to automobiles applies with equal force to horses and vehicles and the equipment incident to their use.

#### MISCELLANEOUS

*Contributions to Charitable Organizations.*—For detailed information with respect to the deductibility of charitable contributions generally, physicians should consult the official return blank or obtain information from the collectors of internal revenue or from other reliable sources. A physician may not, however, deduct as a charitable contribution the value of services rendered an organization operated for charitable purposes.

*Social Security Taxes.*—The excise taxes imposed on employers by section 804, title VIII, and section 901, title IX, of the Social Security Act, commonly referred to as old age and unemployment benefit taxes, are deductible annually by employers in computing net income for federal income tax purposes. If the taxpayer's return is made on a cash



basis, as are the returns of practically all physicians, the taxes are deductible for the year in which they are actually paid. If the return is made on an accrual basis, the taxes are deductible for the year in which they accrue, irrespective of when they are actually paid. Employees, including physicians whose employment brings them within that category, may not deduct the tax imposed on them by section 801, title VIII, of the Social Security Act, generally referred to as the old age benefits tax. If, however, the employer assumes payment of the employee's tax and does not withhold the amount of the tax from the employee's wages, the amount of the tax so assumed may be deducted by the employer, not as a tax paid but as an ordinary business expense.

*Laboratory Expenses.*—The deductibility of the expenses of establishing and maintaining laboratories is determined by the same principles that determine the deductibility of corresponding professional expenses. Laboratory rental and the expenses of laboratory equipment and supplies and of laboratory assistants are deductible when under corresponding circumstances they would be deductible if they related to a physician's office.

*Losses by Fire or Other Causes.*—Loss of and damage to a physician's equipment by fire, theft or other cause, not compensated by insurance or otherwise recoverable, may be computed as a business expense and is deductible, provided evidence of such loss or damage can be produced. Such loss or damage is deductible, however, only to the extent to which it has not been made good by repair and the cost of repair claimed as a deduction.

*Insurance Premiums.*—Premiums paid for insurance against professional losses are deductible. This includes insurance against damages for alleged malpractice, against liability for injuries by a physician's automobile while in use for professional purposes, and against loss from theft of professional equipment and damage to or loss of professional equipment by fire or otherwise. Under professional equipment is to be included any automobile belonging to the physician and used for strictly professional purposes.

*Expense in Defending Malpractice Suits.*—Expense incurred in the defense of a suit for malpractice is deductible as a business expense.

*Sale of Spectacles.*—Oculists who furnish spectacles, etc., may charge as income money received from such sales and deduct as an expense the cost of the article sold. Entries on the physician's account book should in such cases show charges for services separate and apart from charges for spectacles, etc.

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## THE STATE BOARD OF HEALTH

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The following list of laboratories have been granted temporary approval by the State Board of Health and their examinations of specimens will

be accepted in all examinations of barbers, cosmeticians, hairdressers and food handlers as required by health regulations now in force in the state.

St. Louis City: The City Health Department Laboratory and those laboratories in the city that are approved by the City Health Department; The St. Louis County Hospital Laboratory.

Kansas City: General Hospital Laboratory, Research Hospital Laboratory, St. Luke's Hospital Laboratory, St. Joseph's Hospital Laboratory, St. Mary's Hospital Laboratory, Menorah Hospital Laboratory, Duncan Laboratories.

St. Joseph: Hunt Laboratories, Root Laboratory. Springfield: Stone Laboratory, Donaldson Laboratory.

Columbia: University of Missouri Laboratory.

Laclede: Markel-Burke Laboratory.

Jefferson City: St. Mary's Hospital Laboratory.

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Missouri's new Trachoma Hospital at Rolla was opened officially in January. Built at a cost of \$136,000, the new hospital will accommodate sixty-five patients.

"Missouri has been holding its own during the past five years in the treatment of trachoma, but now we expect to make some progress toward cleaning out this disease," stated Dr. J. E. Smith, superintendent of the hospital, recently.

Dr. Smith recently estimated that trachoma, which has cost the State of Missouri over two million dollars in blind pensions since 1922, can be wiped out in one generation with proper hospital facilities and treatment.

Treatment at the Missouri Trachoma Hospital is free, the patients receiving room and board as well as medical treatment. The new building, which is the only one ever to be constructed for the exclusive treatment of trachoma, was made possible by a grant from the State Legislature and the WPA.

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Jasper and Pemiscot counties recently have established full time county health units, bringing to a total of eight the number of counties with units subsidized in part by funds from the State Board of Health. Webb City is headquarters for the Jasper County Unit and Caruthersville for Pemiscot County.

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Douglas County has established a full time public health nursing service. From time to time letters come to the State Board of Health asking the functions of a public health nurse. Some of these inquiries come from practicing physicians and for this reason the five principal functions are stated. The public health nurse: (1) helps to secure early diagnosis and treatment of the sick; (2) renders or secures nursing care of the sick, teaches through demonstration and supervises care given by relatives and attendants; (3) assists the family to carry out medical, sanitary and social procedures for the prevention of disease and promotion of

health; (4) helps to secure adjustment of social conditions which affect health, and (5) influences the community to develop public health facilities through participating in appropriate channels of community education for the promotion of a sound, adequate community health program and shares in community action leading to betterment of health conditions.<sup>1</sup>

1. Functions in Public Health Nursing, N.O.P.H.N.

## DEATHS

**H. J. Wise, M.D.**, Sparta, graduate of the National University of Arts and Sciences Medical Department, St. Louis, 1916; member Christian County Medical Society and president in 1928; aged 46; died May 28, 1939.

**T. Guy Hetherlin, M.D.**, Louisiana, graduate of the Missouri Medical College, St. Louis, 1893; honor member Pike County Medical Society and president in 1928; aged 70; died September 4, 1939.

**R. T. Smith, M.D.**, Newburg, graduate of Barnes Medical College, St. Louis, 1897; member of Phelps-Crawford County Medical Society; aged 76; died November 20, 1939.

**Daniel R. Hill, M.D.**, Joplin, graduate of Ensworth Medical College, St. Louis, 1893; member Jasper County Medical Society; former Health Officer and Commissioner of Health of Joplin; aged 74; died November 27, 1939.

**Oliver C. Sheley, M.D.**, Independence, graduate of the Kansas City Medical College, 1876; honor member of the Jackson County Medical Society and former president; aged 84; died December 2, 1939.

**Clarence I. McCormick, M.D.**, Kansas City, graduate of the St. Louis University School of Medicine, 1919; member Jackson County Medical Society; Fellow; aged 46; died December 7, 1939.

**James R. Rogers, M.D.**, Browington, graduate of the University Medical College of Kansas City, 1909; member Henry County Medical Society; aged 54; died December 13, 1939.

**John Phillip Kanoky, M.D.**, Kansas City, a graduate of the Kansas City Medical College, 1881; honor member Jackson County Medical Society; affiliate fellow of American Medical Association; aged 80; died of injuries received when struck by an automobile, December 28, 1939.

**Fred. H. Brown, M.D.**, Billings, a graduate of Barnes Medical College, St. Louis, 1899; member Christian County Medical Society and served as secretary and delegate; Fellow; aged 64; died January 3, 1940.

**Eli Trimble, M.D.**, Seymour, a graduate of the Louisville Medical College, 1896; honor member of Webster County Medical Society; aged 73; died of diabetes and kidney stone infection January 5, 1940.

**G. S. Wilson, M.D.**, Fortuna, graduate of the Barnes Medical College, St. Louis, 1899; member of the Moniteau County Medical Society and former president, treasurer and secretary; aged 64; died of coronary occlusion January 7, 1940.

**Louis R. Padberg, M.D.**, St. Louis, graduate of the Beaumont Hospital Medical College, St. Louis, 1900; member of St. Louis Medical Society; Fellow; Coroner of St. Louis at time of death; aged 61; died January 22, 1940.

**Leroy E. Belding, M.D.**, St. Charles, graduate of the National University of Arts and Sciences Medical Department, St. Louis, 1912; member St. Charles County Medical Society and secretary-treasurer from 1924 to 1938; aged 51; died as the result of a fall, January 29, 1940.

## COUNCILOR DISTRICT AND SOCIETY PROCEEDINGS

### COUNTY SOCIETY HONOR ROLL FOR 1940

(UNDER THIS HEAD WE LIST SOCIETIES WHICH HAVE  
PAID DUES FOR ALL THEIR MEMBERS)

#### HONOR ROLL

Chariton County Medical Society, December 5, 1939.

Perry County Medical Society, December 11, 1939.

Camden County Medical Society, December 18, 1939.

Miller County Medical Society, December 20, 1939.

Ste. Genevieve County Medical Society, December 22, 1939.

Clinton County Medical Society, December 23, 1939.

### ASSOCIATE EDITORS: COUNCILORS OF THE TEN COUNCILOR DISTRICTS

#### FIRST COUNCILOR DISTRICT

A. S. BRISTOW, PRINCETON, COUNCILOR

#### Caldwell-Livingston County Medical Society

The Caldwell-Livingston County Medical Society met at the Chillicothe Hospital, Chillicothe, at 7:30 p. m., January 19. Dr. H. S. Dowell, Chillicothe, presided.

The following officers were elected: President, Dr. H. S. Dowell, Chillicothe; vice president, Dr. Henry H. Patterson, Braymer; secretary, Dr. H. M. Grace, Chillicothe; delegate (Livingston), Dr. H. S. Dowell, Chillicothe, alternate, Dr. George W. Carpenter, Utica; (Caldwell) Dr. George S. Dowell, Braymer, alternate, Dr. H. H. Patterson, Braymer.

Mr. Pul D. Kitt, attorney, advised on the proper procedure in getting the hospital on the accredited list.

The selection of doctors to contact the councilmen was discussed.

H. M. GRACE, M.D., Secretary.

#### Clay County Medical Society

The Clay County Medical Society met at the Hall of Waters, Excelsior Springs, on January 25.

Petitions were sent to Congressmen expressing sentiment against the Wagner Health Bill, S. 1620.

Dr. Buell L. Ashmore, United States Veterans Facility, Excelsior Springs, transferred his membership to the Clay County Medical Society from the Polk County (Iowa) Medical Society.

The following committee on public policy was appointed: Dr. E. B. Robichaux, Excelsior Springs; Dr. W. H. Goodson, Liberty; Dr. I. C. Fowler, North Kansas City.

The following committee on tuberculosis was appointed: Dr. A. E. Spelman, Smithville; Dr. E. B. Robichaux, Excelsior Springs; Dr. W. H. Goodson, Liberty.

N. R. SCHUHMACHER, M.D., Secretary.



### Nodaway-Atchison-Gentry-Worth Counties Medical Society

The Nodaway-Atchison-Gentry-Worth Counties Medical Society met at the Linville Hotel, Maryville, at 7:30 p. m. January 8. Members present were Drs. F. R. Anthony, C. T. Bell, J. A. Bloomer, L. E. Dean, L. E. Egley, W. R. Galeota, W. R. Jackson, R. C. Person and W. M. Wallis, Maryville; Henry C. Bauman, Fairfax; J. M. Boyles, Conception Junction; B. F. Byland and C. E. Cossins, Burlington Junction; Eugene L. Crowson, Pickering; J. M. Davis, C. H. Flynn and C. M. Waugh, Tarkio; Charles D. Humbert, Barnard; C. W. Kirk, Hopkins; J. C. Manning, Skidmore; C. T. Settle and E. B. Settle, Rockport. Guests were Drs. Joseph Lalich, Kansas City, Kansas; Gerald R. Rausch and John J. Prusmach, Clarinda, Iowa; Donald H. Breit, Ralf Hanks, I. H. Fuson, Jacob Kulowski and W. Roger Moore, St. Joseph; Morgan L. Holliday, Fillmore; and G. W. Wilson, Jesse Miller and H. L. Stinson, Maryville, dentists.

The president spoke briefly on the purposes and plans of the Society which was formed last month by the hyphenation of its four constituent county medical societies. He expressed his appreciation of his election to the presidency.

Dr. Charles T. Bell, chairman of the committee on organization, recommended that the name of the Society, on the basis of seniority and membership, be the Nodaway-Atchison-Gentry-Worth Counties Medical Society. The name was adopted.

Quorums from two counties being present, the following delegates were elected: (Atchison County) Dr. Emmett B. Settle, Rockport, delegate, Dr. Clifton M. Waugh, Tarkio, alternate. (Nodaway County) Dr. Charles D. Humbert, Barnard, delegate, Dr. Benjamin F. Byland, Burlington Junction, alternate.

The following program committee was appointed for the meetings in February and March: Drs. W. R. Jackson, B. F. Byland and Charles H. Flynn.

Dr. Joseph Lalich, Kansas City, Kansas, instructor in Medicine and Research Fellow to the Hickson Laboratory, University of Kansas School of Medicine, presented a talk on "Hypertension and Recent Advances in Its Treatment," with particular attention to an etiological classification of the types of hypertension encountered. His paper was illustrated with lantern slides.

Dr. Graham Asher, Kansas City, presented a paper on "Clinical and Chemical Evidences of Myocardial Undernutrition: Its Treatment." His discourse was illustrated by lantern slides and a clinical demonstration of his lag-screen cardioscope and his electric amplifier of heart sounds. Several members with minor cardiac disabilities were used as clinical material for the demonstrations.

#### Meeting of February 5

The Nodaway-Atchison-Gentry-Worth Counties Medical Society met at the Hotel Linville, Maryville, at 7:30 p. m., February 5. Members present were Drs. C. T. Bell, J. A. Bloomer, L. E. Dean, L. E. Egley, W. R. Galeota, W. R. Jackson, R. C. Person and W. M. Wallis, Maryville; C. E. Benham, C. D. Haskell and C. M. Waugh, Tarkio; B. F. Byland and C. E. Cossins, Burlington Junction; E. J. Crowson, Pickering; Charles D. Humbert, Barnard; C. W. Kirk, Hopkins; J. C. Manning, Skidmore; Frank H. Rose, Albany; Emmett B. Settle, Rockport, and S. E. Simpson, Stanberry.

Communications from the Secretary of the Missouri State Medical Association, the Councilor of the First District, the Missouri Tuberculosis Association and the Mississippi Valley Medical Society were read and duly noted.

The Missouri State Board of Health's program of smallpox vaccination and diphtheria immunization of school children was discussed by Drs. W. R. Jackson,

W. M. Wallis, C. T. Bell, Frank H. Rose, S. E. Simpson, C. M. Waugh and C. E. Cossins. On motion by Dr. Settle it was decided that the Society should extend an expression of its desire to cooperate fully with the State Board of Health in this program but that the matter of fees for this treatment of both pay patients and indigents be left to the discretion of the individual physicians of each community.

It was announced that one of the papers at the meeting of March 4 would be presented by Dr. L. E. Eckles, Wichita, Kansas, formerly associate professor of pediatrics, Harvard Medical School, on "The Control of Communicable Diseases in Children."

Drs. Emmett B. Settle, C. T. Bell and C. E. Cossins were appointed to arrange the scientific programs for the April and May meetings.

Dr. Settle moved that invitations be extended by the Society to the Council of the Missouri State Medical Association and the First Councilor District to meet in Maryville on April 1 as guests of the Society. The motion was seconded and carried.

Drs. C. T. Bell and W. R. Jackson were appointed to represent the Society in the work of Group Hospitalization, Inc., whose program was endorsed by the Nodaway County Medical Society at the March and April meetings.

Dr. A. B. McGlothlan, St. Joseph, spoke on "X-Ray Therapeutics," emphasizing the current trend toward higher voltages and higher wave lengths for more intense biological effects; he also gave particular attention to tumor treatments.

The government F. S. A. program of health insurance by groups was discussed by Mr. Rose, a departmental agent. The president appointed Drs. C. T. Bell, W. R. Jackson and C. W. Kirk a committee to inquire into the plan offered and advise the Society as to the expediency of endorsing it.

The meeting adjourned on motion at 10:30 p. m. The next meeting will be held on March 4.

CHARLES D. HUMBERT, M.D., Secretary.

### EIGHTH COUNCILOR DISTRICT

H. L. KERR, CRANE, COUNCILOR

#### Dallas-Hickory-Polk County Medical Society

The Dallas-Hickory-Polk County Medical Society met in Halfway on February 6 with the following present: Drs. Ernest B. Hanan, J. F. Roberts and G. D. Smith, Bolivar; T. D. Wrinkle, Halfway; V. H. Greenwood and R. E. Harrell, Bolivar; H. H. Bowerman, Humansville; C. H. Brown, Fair Play; Allen W. Gifford and E. E. Glenn, Springfield.

Dr. G. D. Smith, Bolivar, was appointed director of the Polk County Children's Clinic to succeed Dr. H. H. Bowerman, Humansville, resigned.

Several musical numbers were given by the Music Department of the Halfway Highschool.

Dr. Allen W. Gifford, Springfield, spoke on "Conditions of the Nose and Throat as Related to the Chest."

Dr. E. E. Glenn, Springfield, discussed "High Blood Pressure and Associated Heart Conditions."

The next meeting will be held at the Humansville Hospital on March 5 at 3:30 p. m.

R. E. HARRELL, M.D., Secretary.

### NINTH COUNCILOR DISTRICT

ELDON C. BOHRER, WEST PLAINS, COUNCILOR

#### Dent County Medical Society

The Dent County Medical Society met at the office of Dr. F. E. Butler, Salem, January 19 at 8:00 p. m. Dr. Marvin Grossman, Salem, vice president, presided.

The following officers were elected: President, Dr. Marvin Grossman, Salem; vice president, Dr. George

E. Joseph, Salem; secretary-treasurer, Dr. F. E. Butler, Salem; delegate, Dr. F. E. Butler, Salem; alternate, Dr. L. H. Hunt, Salem.

A round table discussion was held on the "Baby's Health Bill," communications on the barber board, the Farm Security Program and the Wagner Health Bill.

Dr. C. H. Meinershagen, Salem, stated that he was being transferred to Carthage and asked for a transfer card.

F. E. BUTLER, M.D., Secretary.

## TENTH COUNCILOR DISTRICT

E. J. NIENSTEDT, SIKESTON, COUNCILOR

### Cape Girardeau County Medical Society

The Cape Girardeau County Medical Society met at the Colonial Tavern, Cape Girardeau, February 12, for dinner.

Honoring the request of the American Social Hygiene Association, the subject of the program was "Syphilis."

Dr. A. H. Conrad, St. Louis, spoke on "Cutaneous Manifestations of Syphilis and Their Treatment."

Dr. C. M. Charles, St. Louis, discussed "Systemic Manifestations of Syphilis and Their Treatment."

Dr. T. K. Brown, St. Louis, talked on "Prenatal and Congenital Syphilis and Their Treatment."

Dr. Lee D. Cady, St. Louis, discussed "Neurosyphilis and Its Treatment."

The following members and guests were present: Drs. A. H. Conrad, C. M. Charles, T. K. Brown and Lee D. Cady, St. Louis; J. Lee Harwell, J. Lester Harwell, H. M. Henrickson, D. A. Hoxie and J. W. McPheeters, Poplar Bluff; D. I. L. Seabaugh, Jackson; W. O. Finney, Chaffee; W. L. Digges, New Madrid; C. T. Herbert, D. B. Elrod, D. H. Hope, J. H. Cochran, H. L. Cunningham, Frank Hall, R. A. Ritter, H. V. Ashley, P. B. Nussbaum, W. F. Oehler and C. A. W. Zimmermann, Cape Girardeau.

A letter from Dr. W. A. Schoen, Cape Girardeau, submitting his resignation because of ill health was read. On motion of Dr. D. H. Hope, Dr. Schoen was made an honor member.

A communication from the chairman of the Council which embodied a copy of a report of the Judicial Council of the American Medical Association concerning professional relationships, and which the committee at its meeting on November 26, 1939, recommended be placed in the hands of all county societies, was read. On motion of Dr. J. H. Cochran, seconded by Dr. R. A. Ritter, the report was ordered mimeographed and sent to all members of the Society.

A communication from the Mississippi Valley Medical Society, which explained its splendid general condition and announced that its Hospital and Sanitarium Insurance Plan was in effect, was read and ordered filed.

An invitation from the Missouri Tuberculosis Association to attend a banquet at Columbia on March 8 was communicated to the members.

A letter and plan submitted by the supervisor of the Farm Security Administration with the request that the Society adopt a resolution concerning the matter was presented. The secretary advised the Society that he had demanded the insertion of a clause in the plan which would guarantee that no other groups would be injected in the plan and that to date this request had not been honored. Thereupon it was decided to table the matter for the present.

The Medical Society of the State of New York requested members to subscribe to its journal. This communication was read and filed.

The scientific program was greatly enjoyed. At the

close of the meeting an expression of thanks was voted the four essayists.

C. A. W. ZIMMERMANN, M.D., Secretary.

### St. Francois-Iron-Madison-Washington-Reynolds County Medical Society

The St. Francois-Iron-Madison-Washington-Reynolds County Medical Society met at the St. Francois County Courthouse, Farmington, January 26.

Dr. Lee Pettit Gay, St. Louis, gave an interesting talk on "Allergy in the General Practice of Medicine" illustrated with lantern slides.

A letter from the St. Louis County Medical Society was read concerning their action on the Wagner Health Bill. The Society voted to send a letter to Congressman C. Arthur Anderson and Senators Bennett Clark and Harry S. Truman, recording the sentiments against the Bill.

A letter from the State Association concerning the appointment of a special committee on tuberculosis was read. The president appointed Drs. H. M. Roebber, Bonne Terre; W. H. Barron, Fredericktown; B. M. Bull, Ironton, and J. P. Yeagain, Irondale.

A letter from Dr. C. E. Fallet, DeSoto, concerning vaccination was read and discussed. The secretary was instructed to answer it.

After discussion of serologic blood tests for pregnant women, it was decided that the Society should accept the suggestions made on the blank furnished by the Missouri Hygiene Association.

The application of Dr. J. W. Huffman was received.

G. TIVIS GRAVES, M.D., Secretary.

## BOOKS FOR LEISURE MOMENTS

### BUSY LITTLE GENES, BLACK AND WHITE

The story of heredity has not been elucidated completely, but that which is known is fascinating and Amram Scheinfeld gives full play to all the enchanting details in "You and Heredity" (Stokes, New York). The volume is the more remarkable because it was written by a layman although Dr. Morton D. Schweitzer, Research Geneticist of Cornell University, collaborated in certain sections. Clever, informative line drawings convey the author's meaning and add immeasurably to the attractiveness of the book. For example, the fallacies of eugenic sterilization are strikingly set forth in a series of such drawings.

Forty-eight chromosomes, each composed of a myriad of genes, constitute the heredity of each individual. Half of the chromosomes come from each parent, one fourth of them from each grandparent. Only one chromosome will be derived by a modern child from an ancestor living at the time of Napoleon and the chances are six hundred and eighty to one against the inheritance of a specific characteristic passed on from an ancestor living when Columbus discovered America. Hence it becomes evident that the inheritance of intelligence, physical prowess, aesthetic appreciation, or what you will, is a nebulous gamble; that the acquisition of genealogical charts is lucrative for the genealogist but uninforming as to the qualities of the last descendant of the clan and that the Reginald Twombly Dunn-Twerpps are the persons most likely to want such a bolster to their self-esteem.

While hereditary endowment may provide a specific aptitude, unremitting effort alone will bring it to fruition. This is nowhere more strikingly evident than in the original investigation of musical talent presented by the author. Once the hereditary factors have combined to effect particular potentialities environment alone will determine their further development. For example, Scheinfeld writes, if the son of a Jewish rabbi and the



son of Hitler were miraculously to change places immediately after birth, the former would become an ardent Nazi, the latter a Talmudist and inflammatory Anti-Nazi.

The x and 5 chromosomes are of particular interest, the one the sex chromosome of the female, the other the sex chromosome of the male. If two x's combine in the new formed child it will become a girl; an x and a y will make a boy. In the y chromosome, half the size of the x, lie some of the ills to which mere men are heir, as baldness. Not only that, but if the baldness pattern in one's family follows a particular pattern (and it always does) one will develop the same type of baldness as his ancestors.

Mutations account for the development of new forms of life. Inexplicable changes in the genes arise in response to as yet little understood factors to produce new forms of life. X-rays may be used to produce mutations but the direction of their effect is unpredictable. Cosmic rays are known to produce mutations. Whether it was the latter the author does not say but he is at pains to point out that the egg came before the chicken. An inexplicable mutation in the genes of the newly fertilized egg produced a chicken instead of the unknown ancestor from which it was derived. A series of mutations have resulted in the development of *homo sapiens* of this time and in the contrast which he offers to his progenitor, *homo sapiens* of 50,000 B. C.

Despite a variety of schemes to improve upon his product it seems likely that man will go on bringing forth children of all varieties. After all, the imponderables are so great that there is no assurance that under any circumstances a child possessed of a particular hereditary endowment could be conceived. Rare as albinism is it would take two thousand years to wipe out half of the genes responsible for it so that by the time this defect could be done away with new mutations could be depended upon to bring about new genes for albinism. There is hope that the sex of a child may be controlled through rigid separation of the x and the y bearing sperm. Then Nature will abort three or four times as many of the potential sons as daughters so that the separation may go for naught. B. Y. G.

#### HEALTH IS PURCHASABLE

Choosing this quotation from one of New York's great health commissioners as title for his first chapter, Frank Ernest Hill offers a wealth of descriptive information dealing with the health educative forces of the nation. The monograph is published under the title "Educating for Health" by the American Association for Adult Education in New York.

Mr. Hill is to be commended for the restraint with which he writes, a vivid contrast to the impassioned diatribes of a De Kruif. As prime examples of the money value of health to the community he cites the experience of New York under Herman Biggs, of Chicago under Herman N. Bundesen, of Detroit under Henry Vaughn. By means of posters, placards, pamphlets, letters to 360,000 mothers, a total of eight and a half million pieces of explanatory literature, Biggs brought about the immunization of 522,000 children against diphtheria. Through a system of widespread education Bundesen gave Chicago the lowest infant mortality rate of any city in the country. Through the formation of a board of experts which sits in judgment upon every infant death in that city he has kept the rate down. Vaughn spent \$200,000 to save Detroit more than a million dollars annually. He changed the percentage of minimal cases of tuberculosis entering sanatoria from 13 to 43, halved the hospital days of one third of the persons with the disease.

If the benefits of modern medical knowledge are to be brought to the greatest number of people an unceas-

ing process of education must be carried on. Appropriations must be increased. Missouri, for example, must raise her expenditure of 5 cents per capita to at least 40 cents. Including federal and local funds, Missouri spends 16 cents per capita. Some states are already spending a dollar per capita through their health departments and reaping corresponding benefits.

This campaign for health must be organized, writes Hill. Doctors must cooperate with public health officials, with publicity experts, with teachers. They must devise a message which their audience will comprehend, not pass over. B. Y. G.

#### BOOK REVIEWS

PSYCHOBIOLOGY AND PSYCHIATRY. A Textbook of Normal and Abnormal Human Behavior. By Wendell Muncie, M.D., Associate Professor of Psychiatry, Johns Hopkins University; Assistant Psychiatrist, Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital. With a Foreword by Adolf Meyer, M.D., LL.D., Sc.D., Henry Phipps Professor of Psychiatry and Director of the Department of Psychiatry, Johns Hopkins University. With sixty-nine illustrations. St. Louis: The C. V. Mosby Company. 1939. Price \$8.00.

This book is an exposition of psychobiology and psychiatry as sponsored and practiced by Adolph Meyer of Johns Hopkins University. It is a pretentious work which attempts to set up a new system of psychiatry to take its place along side those of Freud and Kraepelin. The main idea seems to be that like any normal reaction and the psychoneuroses, the psychoses are no more than "an experiment of nature," "behind the scenes" factors such as brain changes and endocrine disturbances being eliminated from the picture at least in any primary role. In other words, there is nothing fundamentally different between the aberrations of a praecox and the forgetting of one's fountain pen in the morning. Since the etiology and nature of the psychoses are entirely obscure anyone is entitled to propose any theory which he sees fit; but whether many will agree is another matter.

The procedure of examination and treatment apparently are not very different under this new system from those practiced by most psychiatrists except as to the greater detail demanded. However, we are offered a new grouping of the psychoses and psychoneuroses and a whole list of new terms. These also seem to constitute a difference more in form than in kind because the basis is still evidently the old Kraepelinian division. It is not immediately evident how these innovations necessarily follow upon the theoretical premises nor is any other particularly urgent reason for the rearrangement apparent. Most of those concerned would perhaps appreciate having the presentation kept as simple and as much in accordance with the familiar as is possible.

Normal psychobiology, if one may use the expression, is presented in the first 130 pages and the student is supposed to acquire it by a study of himself. One might remark that since one's self is the last person to be viewed clearly the student would learn a great deal more by choosing a nonpsychiatric patient for investigation. This section also is rather complicated and it appears, at least to one of the nonelect, that there should be some method of simplification for the student who has no intention of becoming a specialist in the subject; there must be orders of importance which would permit some sort of outline to be made.

The toxic and organic psychoses are also considered but in an incomplete fashion and evidently it would have been better to shorten the work by the exclusion of these altogether. The same is true of the subject of

epilepsy. At the end is a historical survey that while rather prodigal of space (180 pages) is interesting and useful.

The contribution of Adolph Meyer to psychiatry in this country is beyond question but admission of this fact does not obligate one to accept without question any formulation he may sponsor. Nevertheless, as a reference every psychiatrist should certainly have this work on his bookshelves. L. B. A.

**FUNCTIONAL DISORDERS OF THE FOOT.** Their Diagnosis and Treatment. By Frank D. Dickson, M.D., F.A.C.S., Orthopedic Surgeon, St. Luke's, Kansas City General, and Wheatley hospitals, Kansas City, Missouri, and Providence Hospital, Kansas City, Kansas, and Rex L. Diveley, A.B., M.D., F.A.C.S., Orthopedic Surgeon, St. Luke's, Kansas City General, Research, Kansas City, Missouri, and Providence hospitals, Kansas City, Kansas. 202 illustrations. Philadelphia: J. B. Lippincott Co. 1939.

In a concise, simple, yet thoroughly effective manner, the authors have covered the evolutionary development, the anatomy and the physiology of the human foot in a manner that laymen and doctors alike can read with understanding, and still not be forced to wade through unnecessary and voluminous theorizing.

They present in orderly fashion the causes of foot imbalance in childhood, adolescence and adult life, and then outline the various forms of treatment which in their hands have yielded the best results. While on the whole their treatment is conservative, they do not hesitate to emphasize the value of certain operative procedures in well selected cases.

The later chapters of the book deal with foot disorders other than simple imbalance and here again brevity, clarity and simplicity obtain both in the description of the condition and the methods of treatment advised.

The book is a primer and an encyclopedia under one cover and as such should be most valuable not only to general practitioners but to orthopedic specialists as well. C. H. C.

**ANNUAL REPRINT OF THE REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR 1938.** Cloth. 120 Pages. Chicago: American Medical Association. 1939. Price \$1.00.

This volume as usual contains noteworthy examples of the various kinds of reports made by the Council on Pharmacy and Chemistry: (1) preliminary reports; (2) supplemental reports on therapeutic or pharmacologic problems; (3) reports on the rejection of preparations offered for the Council's consideration.

Among the preliminary reports in this volume that on sulfapyridine, which carries a special article by Dr. Perrin H. Long, a Council member who has been much concerned with the work on this drug, is perhaps of greatest interest. After the Food and Drug Administration had released the drug for the use of physicians early in 1939, the Council accepted various brands for inclusion in N. N. R. and in connection with the published descriptions issued another status report (J. A. M. A. 112:1830 (May 6) 1939) based on a questionnaire sent to men who had been prominent in the experimental use of the drug. This report, no doubt, will appear in the next volume of reprinted Council reports. Other preliminary reports are the following: allantoin, a preparation of glyoxyldiureid purposed to supersede the use of surgical maggots; the sulfapyridine, published shortly before the Council acceptance of this new chemotherapeutic drug.

Among the supplemental (or status) reports are those on colloidal sulfur in the treatment of chronic arthritis, showing that much confirmatory evidence is needed to establish the value of this therapy; on ergono-

vine, a careful study of the relation of this newly discovered principle to ergot therapy in general; and on picrotoxin in poisoning by the barbiturates, showing the promise and the present limitations of this antidotal therapy.

Among the reports of rejection the following are noteworthy: Collodaurum, a "colloidal gold" preparation, promoted with unwarranted, exaggerated and misleading claims for its use in the treatment of cancer; Dermo-G, stated to be a mixture of spermaceti, white wax, oil of sweet almonds, sodium borate, precipitated sulphur and water, an unscientific and superfluous mixture marketed under a therapeutically suggestive name with exaggerated, unwarranted claims; Fru-T-Lax, a needlessly complex and unscientific mixture advertised to the public under a misleading and inadequately descriptive name with claims which are unwarranted; and hyposols sulisocol, claimed to be "sulphur colloid" in 2 cc. of "autoisotonized solution," exploited for use in arthritis with inadequate evidence of its therapeutic value. Other rejections are explained in the reports on map and myoston, nupercainal—"Ciba," pulvoids sulfanilamide and sodium bicarbonate (The Drug Products Co., Inc.), quinoliv, sedormid, and tri-costivin.

**PEDIATRIC SYMPTOMATOLOGY AND DIFFERENTIAL DIAGNOSIS.**

By Sanford Blum, A.B., M.S., M.D., Head of Department of Pediatrics and Director of the Research Laboratory, San Francisco Polyclinic and Post Graduate School. With twenty-nine illustrations including one color plate. Philadelphia: F. A. Davis Company. 1938. Price \$5.00.

As the name suggests this book discusses only symptomatology and differential diagnosis of pediatric conditions. The first part of the book is devoted to a discussion of the exanthemata; acute and chronic infectious diseases; general diseases; birth traumas and malformations, and diseases of the newborn. In the second part the discussion is organized according to systems. The third part takes up diseases of the ductless glands, blood, ear, eye and skin, with a final chapter on intestinal parasites. The section of exanthemata would be improved by the inclusion of roseola infantum. The continued use of terms such as "scrofulous" and "diathesis" contribute little to clarity. On the whole, however, the book is well organized, concise and accurate and should be most useful as a reference book for quick review of the salient points of diagnosis. It is well printed and the illustrations, mostly pictures of roentgen ray plates, are excellent. M. M.

**PRIMER OF ALLERGY.** A Guidebook for those who must find their way through the mazes of this strange and tantalizing state. By Warren T. Vaughan, M.D., Richmond, Virginia. With illustrations by John P. Tillery. St. Louis: The C. V. Mosby Company. 1939. Price \$1.50.

The "Primer of Allergy" was written as a companion book to "Practice of Allergy," the latter being for the physician, the former for the patient. Through two editions of "Allergy and Applied Immunology" the author attempted to reach both physician and patient by one volume. These two books take the place of a third edition.

The purpose of the "Primer of Allergy" is to give the patient sufficient knowledge of his problem to enable him to cooperate intelligently with the physician in an effort to gain relief. While material in this book is based on investigations and work which is presented and credited in the companion book, there is no bibliography given; the material is presented in story style rather than as a scientific treatise.

The book is very readable and should serve the purpose of giving the patient enough knowledge to cooperate more fully.



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### LEPROSY

GEORGE B. TUTTLE, M.D.

ST. LOUIS

Leprosy is a chronic, infectious disease due to the *Bacillus leprae* of Hansen, now designated as the *Mycobacterium leprae*, and is characterized by alterative and destructive changes in the cutaneous, neural, bone and mucous membrane structures of the body.

#### HISTORY

Probably the oldest authentic writings on leprosy, quoted from the papyrus of Ebers and Brugsch, were by Mahammed Abdel Khalik El Dalgomonin, Leprosy Minister of Public Health in Egypt. These papyri are some thirty-five hundred years old and give good descriptions of a disease simulating leprosy with prescriptions for treatment and measures for combating it by expelling lepers from the cities and compelling them to live in a special town known as "Avaris" or the "City of Mud," situated in the northeastern part of the Delta. Some historians claim that the Jews were driven out of Egypt partly because of the prevalence of leprosy among them.

The scriptures are full of reference to lepers and leprosy but some authorities believe that the Biblical type was different from the scourge that ravaged Europe during the Middle Ages. Voltaire once said, characteristically, "All we gained in the end by the crusades and of all that we acquired, that was the only thing we kept." However, research has shown that this statement was unfounded for early documents reveal that leprosy existed in Europe prior to the First Crusade. The Arabian physicians in Egypt described leprosy and during the reign of the Mamelukes asylums were started for their segregation.

The presence of leprosy in the Hawaiian Islands was noticed first shortly after 1820 when the first missionaries arrived. It was supposed to have been brought in by returning sailors from the Orient or

by Chinese immigrants. In 1866, Kalaupapa, on the Island of Molokai, a peninsula of about ten square miles at the foot of a high cliff, was designated as the place for segregation of lepers. Kaliki Receiving Station, in Honolulu, under the supervision of the United States Public Health Service, is used as a receiving station for new patients and experiments in cultivation of the bacillus and treatments.

Leprologists in many countries have been experimenting on the "in vitro" growth of the causative agent of leprosy. The majority report of the International Congress at Cairo in March 1938 states that this problem has not been solved. The minority report believes that the organism has been cultivated by Professor W. Kedrowsky and a few others and urges that the investigators be encouraged in this line, but always to work without preconceived ideas about the strict acid-fastness of the different bacterial forms which are, in the opinion of J. Reenstierna, only broken down stages of some lower fungus.

#### ETIOLOGY

The etiology of leprosy is, undoubtedly, the *Mycobacterium leprae* but the manner of its entrance into the system is unknown. The period of incubation also is unknown but it may be anywhere from one to twenty years or more before a diagnosis can be made. I am acquainted with one young woman, a daughter of leprous parents, in whom leprosy was diagnosed positively from a lesion on the forearm when she was 18 months of age. The lesion was excised and the bacillus was found microscopically. She is now 25 years old, and has never been out of the Leper Settlement except for short periods of about ten days. She has been married for the last seven or eight years to a man with a very heavy nodular type. She never has had another symptom of leprosy. I know from my own personal knowledge that she has had no signs of leprosy for the last eleven years. Other case histories give ages up to 60 and 70 years when leprosy was diagnosed. There is no certain

Former Resident Physician, Molokai Leprosarium, Hawaii.

evidence of heredity in leprosy but the striking evidence of familial occurrence would make it appear that the result of exposure is determined, in a large measure, by hereditary influence. A child born of leprosy parents in Kalaupapa is removed immediately from its environment and is not allowed to return for a visit before the age of 18 years. Alwik and McKinley, from the Department of Preventive Medicine and Hygiene of Harvard Medical School and George Washington University, say that aside from bacteriological evidence, there is abundance of proof that leprosy is an infectious disease. However, the doctrine of contagion alone is inadequate since relatively few who have been exposed have developed the disease. Attention is called to many marriages in which one is a leper and the other a non-leper, and the non-leper does not develop leprosy though living with a leprosy mate for many years.

#### DIAGNOSIS AND SYMPTOMATOLOGY

The diagnosis is not always easy, though, if the bacillus is found, that settles the question. The symptomatology is variable and, owing to this, two clinical forms are recognized, the neural and the cutaneous. These have been subdivided into N 1-2-3 and C 1-2-3, the mixed types, which form the greater proportion. Designation by the letter N or C is according to whether the neural or cutaneous lesions predominate. In the neural type one sees an enlargement of nerve trunks, anesthesia and hyperesthesia of nerve terminals, paralysis and atrophy of muscles, hyperhydrosis and anhydrosis, all of which may be present in the same patient. Cutaneous lesions consist of erythemas, pigmentations, depigmentations, macules, papules, infiltrations, ichthyosis, tubercles, nodules (these in numerous instances break down into ulcers which are extremely resistant to treatment), alopecias (madarosis and alopecia areatas) and dermatitis. Other than alopecias, the scalp is affected comparatively rarely. Alopecia is much more prevalent among Oriental patients than in other races. Hayashi found alopecia and eye symptoms more prevalent in cold regions than in warm. One of the first symptoms noticed by many patients in Hawaii is a round macular reddish patch about the size of a dime on some part of the body, a frequent site being the malar eminences. This may not be painful or tender and is only noticed because of its conspicuousness. Another occurrence is a burn or injury on some part of the body without pain. The genitalia are rarely affected but one sees nodules occasionally on the glands penis, at times involving the meatus and prepuce. The diagnosis of an early case of leprosy is, at times, difficult and may baffle the most expert of leprologists. It is almost axiomatic in Hawaii that if cutaneous lesions that suggest leprosy are truly leprosy, a careful neurologic examination, particularly the differentiation of hot and cold, will confirm the doubtful diagnosis. The

possibility of a diagnostic skin test has interested leprologists for many years but so far no specific antigen has been found. In the treatment of leprosy no specific has been found unless chaulmoogra oil, or some of its derivatives, be so considered. It has been found by some to be efficacious and has been used in some form for many years, since the fifteenth century, I believe, in China. Many claims for cures have been made but the majority of leprologists do not agree. The ethyl esters of chaulmoogra oil are used intramuscularly, intradermally and subcutaneously. Intravenously its results are negative. Chaulmoogra oil, or its derivatives, combined with improvement and care of the general health, proper diet and exercise is the most generally used treatment. Pyretotherapy has been tried but no very encouraging results have been obtained. Aniline dyes also have been used quite extensively in the last few years but they have not, up to the present, reached a stage warranting recommendations regarding them. Treatment with potassium iodide is frequently followed by disastrous results. The newer sulphanilamide pyridine series has not yet had ample tests.

#### EYE, EAR, NOSE AND THROAT

The eye is involved in many instances, probably beginning as a scleritis or episcleritis. Paralysis of the lids with inability to close is a cause of exposure keratitis. Nodules and ulcers on the cornea are common. A beginning nodule may be cauterized and sight conserved for some years, but if unattended the whole eye may be involved and leproma or phthisis bulbi result. Conjunctivitis, panophthalmitis, corneal opacities, iritis and deeper conditions must be considered. Ulcerations of the mucous membrane result in perforation and destruction of the septum causing a sinking in of the nasal tip and not the bridge, thus differing from the syphilitic nose. The hard and soft palates, tongue, pharynx and larynx are often seats of ulcers and nodules varying in size from a pinhead to a hazel nut. Infiltrations, nodules and edemas of the larynx cause so much constriction that breathing is so difficult or labored that tracheotomy is necessitated. The patients wear tracheotomy tubes until death. The total number of tracheotomies from 1932 to June 1, 1939, was seventy-two, of which thirty-two still are living, some of them four years after tracheotomy was performed. The average length of life of those who died was one year six months and fourteen days.

#### GENERAL SYMPTOMS

Necrotic changes in the long bones result in absorption or disintegration. It is thought that this is caused by loss of nutrition due to failure of the blood supply because of leprosy of the nerves. Perforating ulcers of the planter surfaces of the feet are due to this condition. Onychia and atrophy of the nails are also found. Contractures of the fin-



gers (claw-hand) may be mistaken for arthritis. This condition is due to paralysis and atrophy of the interossei. Patients may live for years without acute symptoms of any kind and be fairly comfortable, then, for some unknown reason, will have an acute reaction with fever, eruption, neuritis and a general feeling of malaise. This is noticeable frequently at menstruation and occasionally during pregnancy or after childbirth. The eruptions appear in different forms which may be macular, papular or linear in outline, raised from one sixteenth to one eighth inch and from twelve to eighteen inches in length and about one inch wide. This reaction generally lasts from fifteen to twenty days before subsiding. It sometimes occurs in paroled patients, thus returning them to the active list. Patients who have shown no clinical symptoms after a number of years and who are microscopically negative after a series of tests appear before a parole board of three physicians and, if passed, have the privilege of leaving the Settlement as they are considered not a menace to the public health. They are required to report at frequent intervals and are under close supervision as well as are their immediate associates. In the histories of five paroled patients this reaction occurred in one after fifteen years, in one after two years, in one after seven years, in one after six years and in one after ten years.

Death from leprosy alone is rare. In three thousand autopsies in the Philippine Islands, in only 10 per cent could no other cause of death be found. The prevailing causes of death at Kalaupapa are pneumonia, tuberculosis, cardiac affections and renal conditions. The average length of life from the time the patient was aware of his condition or when it was definitely diagnosed in 200 patients taken at random who died from 1921 to 1939 was 13.52 years.

The number of patients in the Settlement on July 1, 1928, the time my services began, was 496. The number admitted since that date is 502. The number of patients on May 30, 1939, was 356. The number of children born of leprosy parents (one or both) since November 1928 is 86. I was unable to obtain the correct data of the number of those children who had become lepers but I think it was something like 8 or 10 per cent. Of the total number present and admitted since July 1928 some fifteen or twenty were transferred to other leprosariums.

5202 Cabanne Street.

#### TEMPERATURE AND RESISTANCE TO COLDS

The role which extremes in temperatures play in reducing resistance to cold is explained in *Hygeia, The Health Magazine*, which states: "Overheating causes drying of the mucous membranes of the nose and throat, increasing the ease with which germs may invade it. Chilling may produce congestion in the nose and thus also make it easier for infection to take place."

## SULFANILAMIDE IN THE TREATMENT OF SCARLET FEVER

GEORGE S. BOZALIS, M.D.

AND

HENRY L. BARNETT, M.D.

ST. LOUIS

It is the general feeling of the people working experimentally with the sulfanilamide group of drugs that their effect varies directly with the concentration of the drug and inversely with the number of organisms present. In the treatment of bacterial infections it would seem logical, therefore, to use large doses of the drug as early as possible in the course of the infection. Scarlet fever should be looked upon as a hemolytic streptococcus infection which is characterized always by an early toxic phase and is sometimes complicated by a later extension of the septic phase due to a spread or invasion of the offending organism. Since the early toxic phase, which is responsible for the rash and a large part of the initial fever, is considered by many<sup>1</sup> to be an allergic response to the streptococcus toxin, theoretically, sulfanilamide would be expected to have little early effect. In the septic phase of the disease, however, which represents an actual invasion of the tissues by the organism, sulfanilamide should be markedly effective. Although the manifestations of this invasion usually occur later in the course of the disease, the invasion certainly begins with the onset of the disease. On this basis of the experimental effectiveness of the drug, its greatest effect should be exerted if it is given before or during the early stages of invasion. From a theoretical point of view, therefore, the early administration of sulfanilamide in large dosages would seem rational in the drug treatment of scarlet fever.

Apparently not in keeping with such an expectation, Ulrich and Young<sup>2</sup> in December 1939 reported the use of sulfanilamide in the treatment of scarlet fever with particular reference to its value in the treatment of the complications of the disease. Their material was drawn from a group of 203 cases observed in Isolation Hospital, of whom 107 cases were treated and 96 cases used as controls. Their conclusions were that sulfanilamide caused no decrease in the number of complications following scarlet fever and that it appeared that the drug was of more benefit when given after the development of the complications, since, in their series the cases "who were put on sulfanilamide and then taken off when the temperature dropped to normal, received no effect whatsoever on their adenitis or other complications when it was again resumed." Thalhimer<sup>3</sup> also has stated that sulfanilamide has either no beneficial therapeutic action on scarlet fever or, at most, a questionable one, and that

<sup>1</sup>Read before the St. Louis Medical Society, March 26, 1940.

<sup>2</sup>From Isolation Hospital and the Department of Pediatrics, Washington University, School of Medicine.

although the drug is of some aid in the treatment of some of the complications of the disease it is peculiar that even here the improvement is not as marked as might be expected from the use of sulfanilamide in other kinds of streptococcal infections. Hamilton and Togasaki<sup>4</sup>, on the other hand, recently stated that sulfanilamide, although of little or no value in relief of the early symptoms of the disease, offers protection from complications comparable to that of pooled, human, convalescent serum. Sako, Dwan and Platou<sup>5</sup> had previously reported that among one hundred cases of scarlet fever treated with large doses of sulfanilamide, complications developed in eight; whereas among one hundred similar cases in which the drug was not given complications occurred in forty-one. They believed that too early discontinuance of the drug was the cause of the appearance of mild complications in a few of their cases. Prompted by this last report, it was decided to treat cases of scarlet fever with dosages of sulfanilamide which were larger and continued for a longer period of time than were those of Ulrich and Young. The present report deals with an analysis of three hundred consecutive cases admitted to Isolation Hospital between January 1, 1939, and January 1, 1940, which were so treated, and in which there were no deaths. Because of the marked reduction in the number of complications in the sulfanilamide treated group reported by Sako, Dwan and Platou as compared with their untreated group, it was decided to treat consecutive cases with the drug rather than to deny it to one half of the patients for the purpose of a control study. From this series it would appear that sulfanilamide, in the manner employed, does afford protection against the septic complications of scarlet fever and that when complications do develop in cases which have originally been treated, they respond in general quite readily to sulfanilamide therapy contrary to the idea of an acquired resistance expressed by Ulrich and Young.

The drug was administered orally and the administration was begun immediately after admittance as nearly as possible on the following routine: The dosage was calculated on the basis of 0.2 gm. per kilogram body weight ( $1\frac{1}{2}$  grains per pound) for the first twenty-four hours, given in six divided doses; after twenty-four hours the dosage was decreased one half, the patients receiving 0.1 gram per kilogram body weight ( $\frac{3}{4}$  grains per pound) per twenty-four hours in six divided doses for the remainder of the period of drug treatment. This scheme of dosage was used for children weighing up to 40 kilograms (88 pounds). Children over this weight and adults received 8.0 gms. (120 grains) during the first twenty-four hours in six divided doses, after which they received 4.0 gms. (60 grains) per day in six divided doses as a maintenance dosage. With this dosage, blood concentrations between 5 and 10 mg. per cent of free sulfanilamide regularly were obtained within a

few hours and maintained throughout the course of treatment. Because of the regularity in the absorption of sulfanilamide, it is possible to use an established dosage and to obtain a fairly uniform blood concentration in contrast to the less regularly absorbed derivatives such as sulfapyridine<sup>6</sup> and sulfamethylthiazol. The duration of the period of sulfanilamide therapy is shown in table 1, from

Table 1. Duration of Sulfanilamide Treatment

Days	Number	Per Cent
2	4	1.3
3	19	6.3
4	24	8.0
5	60	20.0
6	41	13.7
7	28	9.3
8	33	11.0
9	20	6.7
10 to 15	50	16.7
15 to 20	11	3.7
Over 20	10	3.3
Total	300	100.0

which it can be seen that 54 per cent of the cases were treated between five and eight days. In general the drug was continued until the temperature had been normal for two or more days and until there was definite improvement in the appearance of the throat and other foci.

The age, sex and race distribution and the severity of the illness of the three hundred cases studied are shown in table 2. From this it can be seen that

Table 2. Distribution of Cases

Age	Number	Per Cent
0 to 2 years	4	1.3
2 to 5 years	56	18.7
5 to 10 years	110	36.7
10 to 15 years	60	20.0
Over 15 years	70	23.3
Total	300	100.0
Sex		
Male	150	50
Female	150	50
Total	300	100
Race		
White	247	82.3
Negro	53	17.7
Total	300	100.0
Severity of Illness		
Moderate	265	88.3
Severe	35	11.7
Total	300	100.0

57 per cent of the cases were less than 10 years of age and 77 per cent less than 15 years. The cases were equally distributed in regard to sex. The ratio of white to colored was 4.6 to 1. In regard to the severity of the illness, the individual cases were judged clinically to be either moderate or severe. The severe group, including thirty-five or 12 per cent of the cases, were those which showed circulatory collapse or other manifestations of extreme toxicity.

The interval elapsing between the beginning of sulfanilamide treatment and the fall of the temperature to normal, in relation to the apparent day of disease when the treatment was begun, is shown



Table 3. *Interval Between Beginning of Treatment and Normal Temperature in Relation to the Apparent Day of Disease When Sulfanilamide Administration Was Begun*

Treatment Begun*	Day†																				Over 20	Temperature Normal on Admittance
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
1	38	19	15	5	4	2		2		1		2										7
2	44	25	23	14	5	1	2	1	1			4					1					8
3	16	7	6	1	2	1	1		1			1	1			1						3
4	4	3	1	1	2		1		1			1									1	3
5	4	1	1						1													2
6			1	1			1				1											
7				1	1																	
10	1	1																				
Total	107	56	48	23	13	4	5	3	4	1	1	8	1			1	1				1	23

\*Apparent day of disease when sulfanilamide administration was begun.

†Interval between beginning of treatment and normal temperature.

in table 3. It can be observed that in 213 or 71 per cent of the cases who received sulfanilamide within the first three days of their disease, the temperature became normal within four days after the drug administration was begun. We do not feel that this can be interpreted as an effect of sulfanilamide on the initial fever which, as discussed earlier, is a part of the toxic component of the disease. Any effect of sulfanilamide on this initial fever, we should rather interpret as due to its action on the septic phase which, even at that time, may be contributing to the fever.

The following complications may be seen. Of the three hundred cases, there were forty-five who showed one or more complications. Of these, seventeen had complications on admittance which leaves twenty-eight cases, or 9.8 per cent, which developed complications later in the course of the disease after sulfanilamide had been given during the early part of the disease. The different types of complications in relation to the age of the patients and the day of the disease upon which the complications occurred are shown in table 4. In considering the effect of sulfanilamide on protection against complications, only the septic complications should be considered. Acute hemorrhagic nephritis, for this reason, probably should be excluded from this list since, although the exact nature of post-scarlet fever nephritis is not known, it is almost certainly not due to an actual invasion of the kidney

by the organisms themselves. Only those cases of cervical adenitis which were associated with an elevation of temperature and definite signs of bacterial invasion of the glands were included in this table. Data concerning the sulfanilamide treatment of the complications and the response to treatment are also included in table 4, and the results are quite striking. Of the treated cases of cervical adenitis, 64 per cent had normal temperatures with marked subsidence of the local signs within forty-eight hours after drug treatment was restarted, and only 7 per cent had an elevation of temperature which persisted for more than five days. Otitis media occurred as a complication in 4.2 per cent of the treated cases and, with sulfanilamide treatment, 67 per cent of these responded within forty-eight hours. There were two cases of surgical mastoiditis, one of which was further complicated by a lateral sinus phlebitis, and both of which recovered uneventfully following operation. It is interesting to note that 97.6 per cent of the complications in this group occurred within from ten to thirty days after the onset of the disease and that 47.5 per cent occurred after a period of twenty days. Since 76.3 per cent of the patients were treated less than ten days originally, it becomes apparent that most of the complications occurred after the original sulfanilamide administration had been stopped and it may be that continuing the drug for a longer period of time might have prevented some of the

Table 4. *Complications in Cases Originally Treated—28 Cases*

Type of Complication	Age						Relation to Day of Disease						Duration of Drug Treatment						Duration of Complication					
	0 to 2 yrs.	2 to 5 yrs.	5 to 10 yrs.	10 to 15 yrs.	Over 15	Total	0 5	5 to 10	10 to 20	20 to 30	Over 30	1	2	3	4	5 to 10	Over	1	2	3	4	5	Over	
Cervical Adenitis		1	9	4		14		1	5	5	3		2	1	2	1	7	1	5	4	1	2	1	1
Otitis Media																								
Unilateral		6	3			9			6	2	1			2	1	2		4	4	2				3
Bilateral	1	1	1			3			2	1						2		1	2					1
Mastoiditis		2				2			2							1								2
Ac. Hem. Neph.					2	1	3		1	1	1													3
Recurrences									1	1		1					1			1				1
Sinusitis		1	2			3			2	1						1	1	1	3					
Peritonsillar Abscess			1			1	2		1	1							2		2					
Tonsillitis			1			1						1						1		1				
Lateral Sinus Phlebitis		1				1						1								1				
Streptococcic Septicemia		1				1			1									1				1		1
Total	1	14	18	6	2	41	1	21	13	6		2	4	4	7	11	10	16	6	3	3	1	12	

complications which occurred in this group. That we used larger dosages of sulfanilamide and continued the administration for a longer period of time than did Ulrich and Young is the apparent explanation for the contradictory findings, since the prompt response of most of the complications to sulfanilamide treatment in the cases in which the drug had been given during the early part of the disease and the apparent reduction in the number of complications in the treated cases is directly opposed to their findings. The history of the single case which might be interpreted as substantiating their conception of an acquired resistance of the organism to sulfanilamide is given in the accompanying protocol of case 1, in which sulfanilamide had no apparent effect on the development and progression of a suppurative cervical adenitis, which was proved to be due to a hemolytic streptococcus.

#### REPORT OF CASE

Case 1. A. N. White male, aged 4, was admitted to the hospital on September 27, 1939, with a history of fever and irritability of one week's duration; swelling of the right elbow for four days and the appearance of a skin rash three days before admittance. There had been a history of injury to the elbow two weeks before admittance. The past history revealed that the patient had been at Isolation Hospital one and one half months prior to this admittance with a diagnosis of encephalitis (St. Louis type). The family history was not unusual.

On admittance the patient did not appear acutely ill. There was a rash typical of scarlet fever. There was an indurated tender swelling over the medial side of the humerus, approximately 4 by 3 inches which was hot and over which the skin was slightly reddened. There was no fluctuation and no apparent attachment to bone or the deep structures.

The patient was started on sulfanilamide and wet packs were applied to the right elbow. Roentgen ray examination of the elbow showed only soft tissue swelling. After admittance the temperature became normal. There was prompt subsidence of the lesion of the elbow and the patient in general did quite well. On October 25, 1939, the patient again developed a sore throat and a typical scarlet fever rash. The patient was again started on sulfanilamide and the temperature became normal until October 28, 1939, but following this began to show slight elevations. The sulfanilamide was continued this time until November 7, 1939. On November 18, 1939, a large anterior cervical gland began to show enlargement. The patient was again put on sulfanilamide, but the gland continued to enlarge, became quite tender and on November 30, 1939, an incision was made with a release of a large amount of purulent material from which a hemolytic streptococcus was cultured. Following incision and drainage of the cervical gland, the temperature remained elevated and the patient remained quite toxic for three days during which time he received numerous blood transfusions. Following this there was rapid improvement in the patient's condition until discharge on December 23, 1939.

We cannot offer a satisfactory explanation for this case. The prompt response of the other cases of cervical adenitis similarly treated would seem to rule out the possibility of an acquired resistance, and other instances of resistant hemolytic streptococcus infections have been reported<sup>6</sup> as rare occurrences with no adequate explanations. With

our more recent experiences with certain other of the sulfanilamide derivatives, particularly sulapyridine and sulfamethylthiazol, it would appear that in a case of such an apparent resistance of an organism to sulfanilamide it would certainly be indicated that either of these other drugs be tried.

Additional treatment of these cases included the usual measures for the medical care of sick patients. Scarlet fever antitoxin was given to a total of thirty-nine cases, among whom were the thirty-five classified as severe. The criteria for the classification of the severe cases were extreme toxicity, excessive diarrhea and vomiting and circulatory collapse as evidenced by low blood pressure or by markedly slow return of the blush after blanching by pressure. In the moderately severe case of scarlet fever, the administration of antitoxin is followed by a dramatically prompt response as manifested by rapid disappearance of the rash and a precipitous fall in temperature. This is in marked contrast to the apparent ineffectiveness of sulfanilamide on this phase of the scarlet fever as would be expected from the theoretical considerations mentioned earlier. In the severely toxic cases, however, although there is a prompt disappearance of the rash, the fall in temperature and the general clinical improvement occur more slowly over the course of several days. In addition to the intravenous and intramuscular administration of 6,000 or 12,000 units of scarlet fever antitoxin, such cases were treated as medical emergencies and given intravenous and subcutaneous fluids up to 100 cc. of parenteral fluids per kilogram body weight per day.

Although the early toxic symptoms in the usual case of scarlet fever do not comprise the dangerous part of the disease, these do become of extreme importance in the severely toxic case. The value of antitoxin or convalescent serum in controlling this phase of the disease, and also the reported value of the latter in reducing the number of complications,<sup>4</sup> would seem to indicate that the administration of antitoxin or convalescent serum to every case of scarlet fever would be the ideal method of treatment. However, because of the expense and inherent dangers in the use of the former and the lack of general availability of the latter, the more practical method of treatment at the present time would seem to be the early use of sulfanilamide in all cases of the disease and the administration of either antitoxin or convalescent serum to those showing extreme degrees of toxicity.

With this routine of administering large doses of sulfanilamide to all cases of scarlet fever as early as possible, and of giving antitoxin to those cases showing extreme degrees of toxicity, we have treated three hundred consecutive cases of the disease with no deaths. This becomes of more significance when it is considered that the series included thirty-five cases who were extremely toxic as well as two cases of mastoiditis, one of which was further



complicated by the presence of lateral sinus phlebitis, and one case of hemolytic streptococcus septicemia.

Tonsillectomy, usually combined with adenoidectomy, was done on forty cases, or 13 per cent, of the three hundred cases. The usual indications for such operations were persistent enlargement of the cervical glands, sinusitis, otitis media or chronic tonsillitis. Table 5 indicates the distribution of the

Table 5. Cases Operated for Removal of Tonsils and/or Adenoids

Age	Day of Disease								Total
	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 to 60	Over 60	
2 to 3									5
3 to 4			3				1	1	5
4 to 5				1		2			3
5 to 10	1			2		2			5
10 to 15	2	3	5	4	3	1			18
Over 15	2	1	2	1			1		7
Totals	6	5	10	8	3	5	2	1	40

age groups and the day of the disease when the operation was done. All these patients received sulfanilamide for one day preceding and usually for four or five days following operation in dosages of 0.1 gm. per kilogram body weight ( $\frac{3}{4}$  grains per pound) per twenty-four hours in six divided doses. Despite the fact that such operations were done in the presence of adjacent infection and mostly during the winter and spring months because of the prevalence of scarlet fever during this time, in no instance was there any local or general reaction to this operative procedure, no peritonsillar cellulitis or exacerbation of cervical adenitis, nor any precipitation or exacerbation of nephritis. Removal of the tonsils and adenoids in such cases usually resulted in prompt disappearance of the signs of residual infection. In view of these results, it would appear that the general fear of tonsillectomy during these periods of the year and in the presence of active infection, particularly sinusitis in which the purulent discharge directly bathes the denuded area, may be in large part eliminated by the use of sulfanilamide before and after operation in adequate dosages.

The toxic effects attributed to sulfanilamide are listed in table 6 in which the various reactions are tabulated in relation to the age of the patients and the day of sulfanilamide therapy upon which they were recognized. There were a total of twenty-three toxic effects in twenty-one patients, a total

incidence of 7 per cent. These did not include such side effects as mental confusion, nausea or vomiting, the latter two of which were quite rare in this series, probably due to the large percentage of children in whom these effects seem to be less common.<sup>7</sup> An elevation of temperature which occurred with no manifest cause and which subsided within twenty-four or forty-eight hours after the drug administration was discontinued occurred in fourteen or 5 per cent of the cases. Cutaneous rashes occurred in seven or 2 per cent of the cases. A single case of acute hemolytic anemia which became manifest after thirty-six hours of treatment responded favorably after withdrawal of the drug to blood and fluid administration. In one instance we observed a definite myeloid response to sulfanilamide. This was discovered in a 6 year old colored female, weighing 21 kilograms, on the sixth day of treatment after she had received 24.0 gm. of sulfanilamide, and was manifested by an apparently sudden rise in the white blood cell count from 21,000 to 75,000 per cubic millimeter, associated with a marked shift to the left in the hemogram, both of which subsided promptly. During this period the red blood cell count fell from 4.95 million to 2.65 million. There was no fever, rash nor other toxic symptoms associated except for a mild degree of methemoglobinemia, easily controlled by methylene blue by mouth.<sup>8</sup> A myeloid response similar to this but associated with fever, anemia, mild icterus and hemoglobinuria, has been reported with sulfapyridine by Moody and Knouf.<sup>9</sup>

#### SUMMARY AND CONCLUSIONS

From a theoretical point of view the early administration of sulfanilamide in large dosages is rational in the drug treatment of scarlet fever.

We have analyzed three hundred consecutive cases of scarlet fever treated with sulfanilamide in large dosages. There were no deaths in the entire series. The results indicate an apparent reduction in the number of septic complications which might have been further reduced had the drug administration been continued longer. When complications did occur in the cases originally treated, there was in general a prompt response to further sulfanilamide treatment contrary to the findings of Ulrich and Young.

With the use of sulfanilamide before and following operation, tonsillectomy, usually combined

Table 6. Toxic Effects Attributed to Sulfanilamide

	Age					Total	Per Cent	Day of Treatment																	Day After Readminis- tration		
	0 to 2 yrs.	2 to 5 yrs.	5 to 10 yrs.	10 to 15 yrs.	Over 15			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	1	2	3
Fever		3	2	5	4	14	4.7				1	1	4	3	1		2	1						1			
Rash		5	1		1	7	2.3		1					2		3	1										
Anemia			1			1	0.3		1																		
Myeloid Response				1		1	0.3						1														
Total		8	5	5	5	23	7.6		2		1	1	5	5	1		5	2						1			

with adenoidectomy, was done on forty of the cases with no reactions despite the fact that the operations were performed during the winter and spring months and in the presence of active infections.

The observed toxic effects of sulfanilamide do not contraindicate its careful routine usage.

Scarlet fever antitoxin in combination with sulfanilamide was given to thirty-nine cases which showed extreme degrees of toxicity.

With the routine of administering large doses of sulfanilamide to all cases of scarlet fever as early as possible in the course of disease, and of giving antitoxin to those cases showing extreme degrees of toxicity, three hundred consecutive cases of the disease were treated with no deaths.

5600 Arsenal Street.

#### BIBLIOGRAPHY

1. Cooke, J. V.: Scarlet Fever, *Ann. Int. Med.* 2:484-491 (September) 1937.
2. Ulrich, H. J., and Young, T. R.: Sulfanilamide and Complications in Scarlet Fever, *J. Missouri M. A.* 36:445-447 (November) 1939.
3. Thalheimer, W.: The Prophylactic and Therapeutic Use of Convalescent Serums: Scarlet Fever, Mumps, and Chicken Pox, Round Table Discussion on Convalescent Serum Therapy, *J. Pediat.* 14:257-261, 1939.
4. Hamilton, P. M., and Togaski, Y.: Prophylaxis of Complications of Scarlet Fever, *J. Pediat.* 14:655-657, 1939.
5. Sako, W.; Dwan, P. F., and Platou, E. S.: Sulfanilamide and Serum in the Treatment and Prophylaxis of Scarlet Fever, *J. A. M. A.* 111:995-997 (Sept. 10) 1938.
6. Hartmann, A. F.; Barnett, H. L.; Perley, A. M., and Ruhoff, M. B.: Present Status of Therapy With Sulfanilamide and Sulfapyridine, *J. Missouri M. A.* 37:41-54 (February) 1940.
7. Barnett, H. L.; Hartmann, A. F.; Perley, A. M., and Ruhoff, M. B.: The Treatment of Pneumococcal Infections in Infants and Children With Sulfapyridine, *J. A. M. A.* 112:518-527 (February) 1939.
8. Hartmann, A. F.; Perley, A. M., and Barnett, H. L.: A Study of Some of the Physiological Effects of Sulfanilamide. II. Methemoglobin Formation and Its Control. *J. Clin. Investigation* 17:688-710 (November) 1938.
9. Moody, E. E., and Knouf, E. G.: Leukemoid Reaction With Sulfapyridine, *J. Pediat.* 15:740-742, 1939.

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#### URGES SUPPORT OF PLANS TO ERECT NEW ARMY MEDICAL LIBRARY HOME

"Constantly in abeyance for almost a decade has been the proposal to erect a new building for the Army Medical Library and Museum in Washington, D.C.," *The Journal of the American Medical Association* for March 16 declares. "Now the path has been cleared, a site has been found near the Library of Congress, and all that is necessary is the final appropriation.

"The collection of medical works in the Army Medical Library is one of the finest in the world; indeed, it is thought by many to deserve the absolute superlative. Yet it is housed today in an ancient structure, a veritable fire trap, in which an accident of some type might bring about catastrophic destruction of material which could never be replaced. Certainly if ever a need existed for expenditure of money for some real purpose, it exists in relation to the necessity for building a new home for this invaluable scientific medical collection.

"Recently the Librarian of Congress, Archibald MacLeish, was asked his opinion of the Army Medical Library. His reply was, 'The Surgeon General's Library is one of the greatest special collections of books ever put together, if not indeed the greatest, and its present lack of housing holds tragic possibilities for American learning and for the good repute of American learning.' In the very near future Congressional hearings will be held on this project. Every physician may well afford to lend his voice to the appeal for immediate action."

## NEUROLOGIC ANATOMY AND PHYSIOLOGY OF THE BLADDER AND ITS CLINICAL APPLICATION IN UROLOGY

NINTH BELFIELD MEMORIAL LECTURE

D. K. ROSE, M.D.

ST. LOUIS

It is just fifty years since William Thomas Belfield<sup>1</sup> pioneered in urology by reporting progress in suprapubic prostatectomy. At that time the physiology of the bladder was definitely the unimportant part in obstructive conditions. Fifty years from today our successors will lay even greater stress on bladder function, it being intermediary between the obstructive condition and the general economy. Therefore the manner in which the bladder functions should be understood definitely and accurately. Our interest tonight lies chiefly in bladder innervation which has long eluded our efforts, principally because it cannot be divorced from the myogenic action, that is, the contractility of the organ inherent in its shape, elasticity and intra-abdominal position together with its vesical plexus.

#### CEREBRUM

The desired facts further are elusive in application in human physiology because vesical innervation varies markedly in different mammals (R. R. Elliott, 1907). One great difference in man is his superior cerebration. He anticipates, is self-conscious, and often is governed by social customs and these exert a powerful influence on his urinary habits and, in some instances, his bladder control. The normal muscular or myogenic status of the bladder wall may be altered, particularly if some degree of hypo-irritability or hyperirritability is already present. These are circumstances not found in experimental surgery on the dog or cat. Also, in all such experimental work, the myogenic alteration due to instrumentation may be overlooked as well as possibly the effects of any anaesthesia used be undervaluated. Also, it is necessary to record vesical volume and intracystic pressure simultaneously and not to allow a lapse of time for the bladder to accommodate itself to the increment of filling.

An important function of the cerebrum is to inhibit,<sup>2,3</sup> with or without voluntary effort. It is generally agreed that this inhibitory influence passes to the bladder at the sacral level of the spinal cord.

Increasing sensory stimuli pass to the spinal cord as the bladder gradually distends and when sufficient, from the standpoint of summation of these impulses, they pass to the motor side and excite bladder contraction. Inhibition can be considered as a resistance interposed between the sensory and motor sides within the cord. If this resistance is great, it is possible to summate these sensory stim-

<sup>1</sup>Department of Surgery, Washington University Medical School, and Barnes Hospital, St. Louis.  
<sup>2</sup>Presented in Chicago, October 21, 1937.



uli, their release occurring as sudden, short spill-overs. This tetanic level of stimulation would produce a quick or forceful bladder wall contraction, accentuated even more if the wall is thickened by contraction of overwork or if hyperirritable. Certain emotions increase or decrease this inhibitory block as fear, pain or anticipation of pain or embarrassment. We can apply this clinically in the inability of some individuals to void without strict privacy, that is, psychic retention, and also to the tremendous bladder capacities we see occasionally at cystoscopic examination. In these instances, the pain and fear of the instrument causes a low pressure and large capacity bladder which is a protective inhibition. It is also a factor in some postoperative retentions.

Bladder representation occurs in the cerebrum but its location is not sufficiently exact to assist in localizing pathological conditions of the brain by consequent behavior of the bladder. Langworthy, Lewis and Dees<sup>4</sup> found that in a right handed individual, a left hemispheric lesion produces greater interference with inhibitory function and is also more frequent than a right hemispheric lesion.

It is thought that both sympathetic and parasympathetic action has brain representation and that injury may occur on the motor or sensory side. If the sensory side is affected, voiding will occur without the patient's knowledge. Removal of the

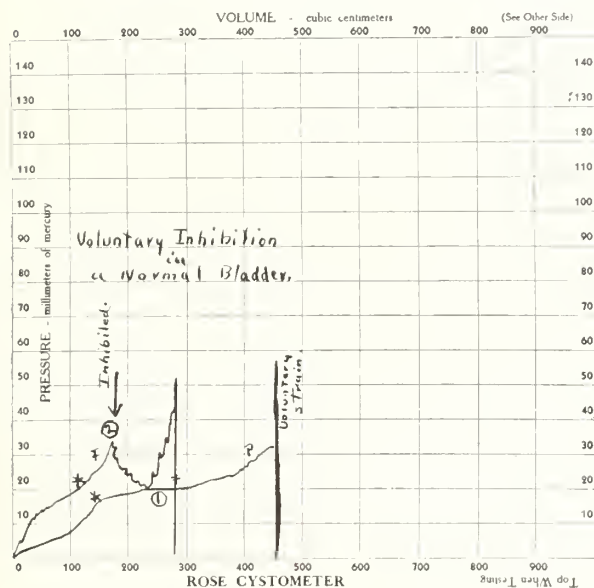


Fig. 1. In these cystometrograms 15 cc. of water is pumped in at each revolution of the cystometer handle. The resistance of the bladder wall to each 15 cc. increment is shown by the presence or absence of irregularities on the volume-pressure line. Each irregularity is, in fact, a stretch reflex reaction as well as the relationship of curve 2 to curve 1 as in the former (2) the bladder wall has been stimulated by the first filling and emptying.

- \* The first desire to void.
- F Fullness or sense of distention.
- P Painful distention.

Two fillings are considered a cystometrogram in that the final opinion is based on the composite picture, that is, relationship of sensory points to the volume-pressure line and of curve 2 to curve 1. At the arrow in curve 2, the patient was commanded suddenly, "Hold your urine. Don't urinate."

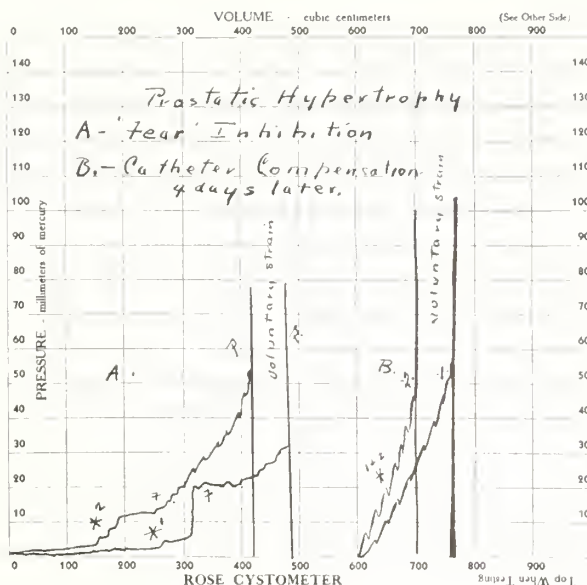


Fig. 2. A. Inhibition is shown by the flat initial portion of each curve in an otherwise hypertonic wall. B. The same bladder after four days of continuous catheter drainage. The voluntary pressure is increased about 20 mm. of mercury by the contraction. If this were insufficient to give perfect drainage to urine and infection, that is, to overcome the block, it would be unwise to remove the catheter or, in effect, to refuse a traumatized, contracted, high pressure bladder further surgical drainage.

cortex removes inhibition and causes the bladder to be overactive, and it is the opinion of these authors (Langworthy, Lewis and Dees<sup>4</sup>) that the pathways from the midbrain or upper end of the hindbrain control bladder tone. Therefore, with bilateral injury to the cortex or internal capsule the cortico-spinal pathways become overactive with a resultant hyperactive bladder. They have found no cases of isolated injury to the pathways from the midbrain and feel that these pathways must be close to the cortico-spinal pathways in the lateral column of the cord and that both are injured together. Injury to the lateral column bilaterally produces the same uninhibited or overactive bladder as does injury to the cortex or internal capsule.

Langworthy<sup>5</sup> (1932) feels that, "Control of tone and contraction of smooth muscle is similar to striated in that it is subserved by reflex arcs traversing almost all portions of the nervous system." Dees and Langworthy<sup>6</sup> state that there is decreased tone of striated muscle upon section of the posterior columns of the spinal cord but that after sectioning of this group of fibers no enlargement of the bladder was noted nor was its function impaired. In this connection we immediately must think of any myogenic factor altering the symptoms. For example, should such a hemiplegia or trauma occur in a man with a prostatic obstruction, in which the bladder wall was markedly thickened or compensated to overcome this obstruction, it is evident that symptoms of frequency of urination, even to incontinence of urgency, would be definitely greater than with a hemiplegia without previous bladder change.

Watts and Uhle<sup>7</sup> in their recent work, "Bladder Dysfunction in Cases of Brain Tumor, A Cystometric Study," concluded that "Abnormalities of bladder function, tone and sensation in patients with brain tumors are probably the result of disturbance of bladder representation in certain parts of the brain and present evidence of bladder representation in the cerebral cortex, the region of the hypothalamus, and even more caudal in the brain stem." They believe that "Bladder representation includes both excitatory and inhibitory components." This offers an explanation of cystometric findings of both hypoactive and hyperactive bladders associated with cerebral injury.

Frazer<sup>8</sup> in seventy-eight patients with frontal lobe tumors found incontinence in 17 per cent. It occurred in some who were normal mentally. In some the incontinence occurred without the patient's knowledge (hypotonic) and in others as a result of urgency of urination (hypertonic).

In regard to the hindbrain pathways which have presented a complication in correlating cerebral pathological condition and its influence on bladder function, Parker and Rose<sup>3</sup> state, "It is clear that a pathway through the hindbrain is not essential for the emergence of an expulsive reaction though such a 'long circuit' pathway may exist in the intact animal as an additional means of facilitating higher control and coordination of the bladder." Its influence, of course, cannot be dismissed but neither can it be applied at this time.

Our interest in "bladder representation" in the brain and associated fibers from a clinical stand-

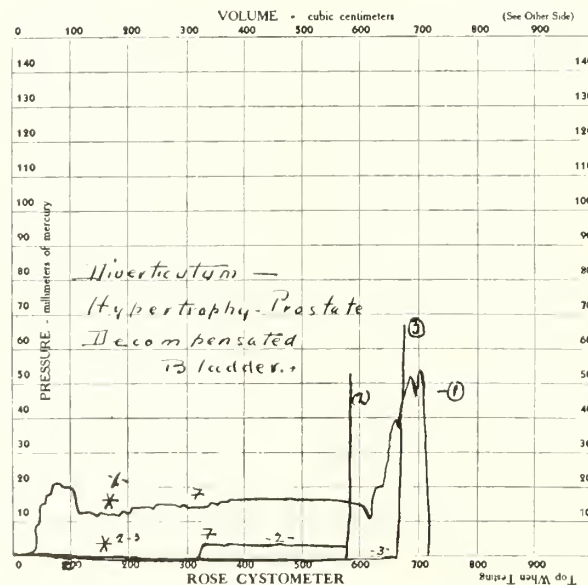


Fig. 3. Patient had an enlarged prostate, 480 cc. infected residual urine. Also showed definite Von Recklinghausen's disease. The differential diagnosis of neurogenic bladder with retention or of hypertrophied prostate with retention was important. Cystometrograms showed progressively lower pressures in all three curves, with, however, normal sensory points. Cystoscopic examination immediately afterwards showed a large diverticulum which accounted for this dissociation of intracystic pressure and sensation. Prostatectomy and diverticulectomy recommended.

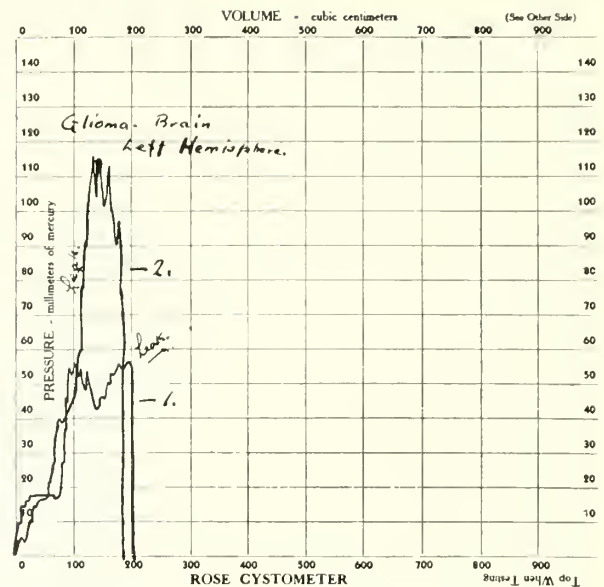


Fig. 4. Glioma, left hemisphere, motor area. No sensation and definite increase in stretch reflex; to each increment of water and in curve 2. Mentally normal. Incontinent day and night, entirely involuntary.

point extends much farther than that associated with nerve destruction by tumor, hemiplegia or trauma, either surgical or accidental. We have to consider the influence of senility, vascular sclerosis, drugs, internal secretion and infection, either acute or chronic. It does not necessitate a flight of fancy in considering these influences to account, at least hopefully, for some of our alterations in bladder function now explained rather empirically. These include particularly symptoms of urinary hypo-irritability or hyperirritability, even to retention or incontinence. Further, such influences are likely to be combined, as bladder wall compensation or infection in association with cerebral sclerosis in a toxic individual. Therefore, again, it is individually necessary to consider the preexisting "myogenic" status of the bladder wall.

Some of these facts may be applied clinically in the following cases.

Case 1. A female, aged 75, with general arteriosclerosis, bilateral pyelitis, extreme toxicity and definitely altered cerebration, carried a large residual urine; had no obstruction. With reduction of toxicity normal cerebration returned and the residual urine disappeared allowing the pyelitis to clear.

Case 2. Male, aged 62, had prostatic obstruction, had had transurethral surgery, was asthmatic and for this reason spent part of his time in the West at a high altitude and part in the Mississippi Valley at a low altitude where he takes ephedrine hypodermically for asthmatic relief. While in the lower altitude he carries a residual urine which he does not have when living at a high altitude and not taking ephedrine.

Case 3. Nurse, aged 35, has fixed idea of bladder difficulty, carries 1500 cc. residual urine when informed that she will be tested for a residual urine at a specific time and has no residual urine when catheterized immediately after leaving a toilet and at a time when she has no suspicion that she might be catheterized for residual urine.



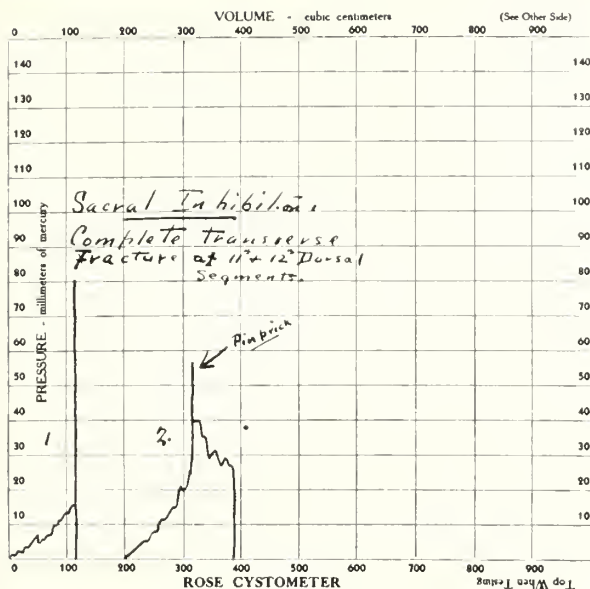


Fig. 5. Reflex inhibition in "patient with complete traumatic transverse lesion, of the cord at the level of the eleventh and twelfth thoracic segments of three years duration."<sup>13</sup> Frequent and complete emptying of the bladder could be brought on by rubbing the abdomen or pulling the penis and thus prevent involuntary incontinence. Curve 1 shows small capacity and high pressure without sensation. Characteristic of release of cerebral control. On curve 2 the inhibition was produced by a pin prick to the anesthetized glans penis or toe. This demonstrates a reflex inhibitory mechanism in the sacral cord.

Case 4. Female, aged 42, had normal sensorium except that she was unduly fearful or anticipatory. She had had an unpleasant experience in frequent voiding at a social gathering ten years previously. At that time her condition was diagnosed as cystocele with no infection. At this later time urological examination offered no explanation of her symptom of frequency of urination except that cystometrograms showed a normal central nervous system with "myogenic" bladder contraction. This symptom is exaggerated until she is actually unable to get away from the immediate proximity of a toilet. She was relieved immediately upon training her in inhibition (which I believe to be one of the important effects of hydraulic distention) by reassuring her, and training her to urinate only when the intake of fluid and lapse of time has been sufficient to warrant it. Otherwise, frequent "nervous" voidings, that is loss of inhibition, retain the bladder in a contracted state and so continue a vicious circle by a hyperirritable stretch reflex.

#### THE STRETCH REFLEX. SPHINCTER CONTROL

Denny Brown and Robertson<sup>2</sup> in 1933 showed that the bladder reacts to a stretch reflex, comparable to the knee jerk, which is fundamental in considering bladder wall activity. They feel that the bladder "is controlled by a restraining effect which, at low volume, is subsconscious in operation. This process of adaptation or modification of reaction intrudes upon consciousness in greater degrees as volume increases. . . ." The reaction to stretch or stretch reflex "is elicited only by increment of stretch and at continuous stretch, or by decrease of the stretch the reaction progressively declines."

As to bladder sensation<sup>2</sup> they feel that there are two types, one responding to contraction and one

to passive enlargement, in the latter instance to elongation of the muscle fibers. Further, they believe that that sensation is set up by a process of adaptation, that there is a threshold of intensity which causes contraction, and that otherwise sensation is derived from passive enlargement. This would mean that sensation is only indirectly related to pressure. Barrington<sup>9</sup> (1933) found that the sensory fibers of the cat which have to do with bladder distention run in the lateral columns of the spinal cord.

Bladder wall contraction, central or peripheral hyperirritability or smooth muscle hypertrophy increase the amplitude of the stretch reflex. In these instances particularly and to a lesser degree in normal bladders, successive bladder fillings increase the irritability and force of the stretch reflex.

The internal sphincter is closely allied to the bladder wall and relaxes as the bladder wall tension increases.<sup>10</sup> It is closely connected with the circular layer of smooth muscle of the bladder and its action is exactly opposite. Its direct innervation, once considered sympathetic and parasympathetic, is now conceived as vesical plexus. Quite directly the greater the intravesical tension, the weaker the internal sphincter tone and, further, it is not in Denny Brown's<sup>11</sup> opinion "a circular but rather a funnel-shaped opening, the relaxed bladder showing only an internal sphincter dimple and the high-tension bladder a definite posterior urethra funnel." The external sphincter, of voluntary or striated muscle, is closely associated in its action

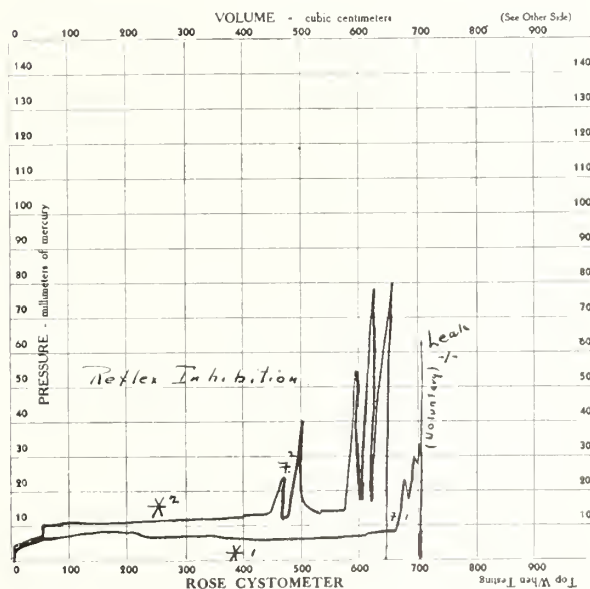


Fig. 6. The changing sensations (\*), relationship of curve 2 to curve 1, the summated contractions on curve 2, that is, each one higher as the inhibition is broken through by the increased afferent filling impulses, all suggest that the residual urine of 90 cc. is inhibitory rather than neurogenic. The original inhibitory stimulation was from a lower bowel impaction and then from an acute cystitis treated by catheterization. The catheterization with irrigations were continued in this particularly anticipatory patient. No obstruction cystoscopically. Relieved of retention by discontinuing catheterization and of infection with mandelic acid.

with the perineal muscles and voluntary anal sphincter. I feel that mobility of the posterior urethra is closely associated with external sphincter action; in fact, that it is more important than actual urethral compression. In males this mobility is made possible by a short, free portion of the prostatic urethra which is just proximal to its fixation at the superior triangular ligament. Contraction of the perineal muscle, therefore, elevates the internal orifice increasing the angulation at both orifices as well as disaligning these openings and thereby increasing their resistance. In females, this upward movement of the contracting perineal muscles is direct on the internal sphincter region. Simons<sup>12, 13</sup> with his sphincterometer determines two sphincters of different strength in females as he does in males.

#### DRUGS

A question remains as to the influence exerted by drugs; by psychic changes and reflexes as in postpartum and postoperative dysurias, and by internal secretion, thyroid probably exerting the greatest influence in hyperirritability. There are also clinically congenital bladder types<sup>12</sup>: (1) the sympathetic type (possibly inhibitory) with large capacity, infrequent voidings, low intracystic pres-

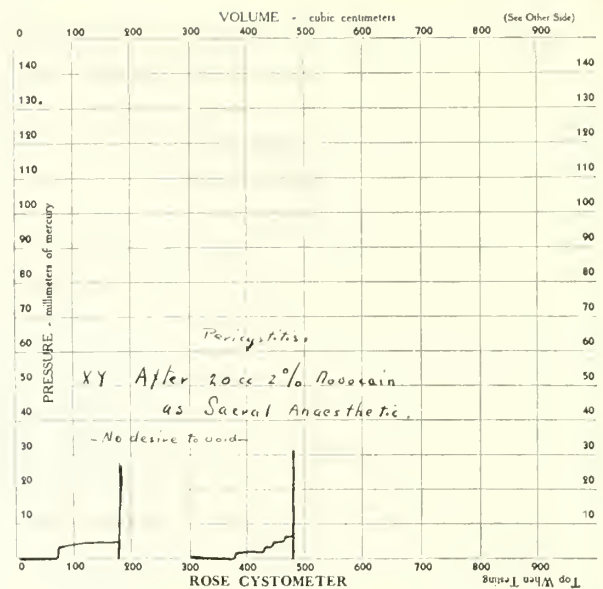


Fig. 8. After sacral anesthesia cystometrograph 8 was made. Although the urethra relaxed and all sense of a desire to void disappeared the pain of overdistention was marked. This gave a diagnosis of scar tissue fixation as in a normal bladder a sacral anesthesia causes a definite hypotonia. Cystoscopic examination negative excepting simple cystitis.

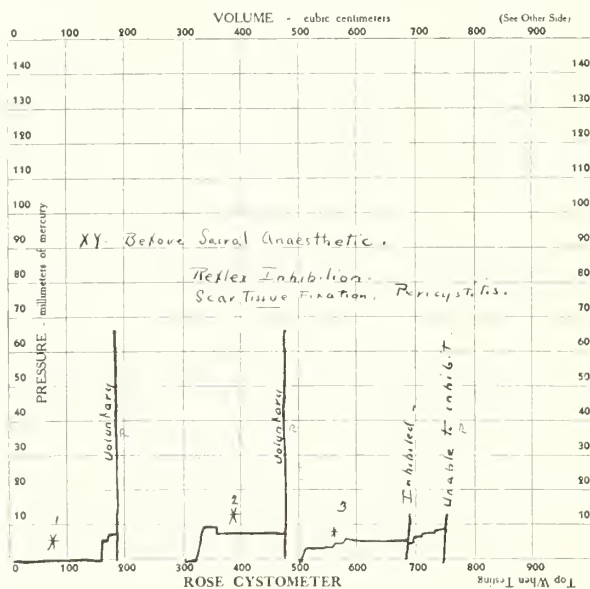


Fig. 7. Reflex inhibition plus scar tissue fixation, pericystitis. Patient XY is demonstrated in cystometrograms 7 and 8. Symptom, marked frequency of urination, residual urine from 30 to 90 cc. of several years duration. More or less constant treatment during this time. Patient became particularly fearful of hydraulic distention. Urine showed infection at times only, although symptoms remained unchanged. The differential cystometric diagnosis was between scar tissue fixation of the bladder wall, a markedly heightened stretch reflex due to motor injury, release of cerebral control or obstruction to the outlet of the bladder with a hypertrophy of the bladder wall, or even a hypertrophy secondary to the frequent muscle contraction associated with the urinary frequency. Curves 1 and 2 show slight release of inhibition in 2, small capacity and normal to high voluntary pressure. In 3 the bladder was filled to capacity at 180 cc. When filling was stopped and the patient asked to prevent bladder contraction, that is, to attempt to accommodate the 180 cc. which was done in from one to two minutes, all pain disappeared. Filling was then recommenced and carried to 250 cc. when pain was intolerable and patient unable to accommodate further.

sure; (2) the parasympathetic type with small capacity, frequent voidings, high intracystic pressure. This type is often associated with enuresis.

A study of drugs with the cystometer<sup>14</sup> using female dogs shows that epinephrin in large doses relaxes the bladder and is considered a sympathetic stimulant. Pituitrin, by its direct action on the muscle, increases the tone of bladder muscle. Atropine increases bladder capacity and lowers intracystic pressure, a parasympathetic inhibitor, while both pilocarpin and acetylcholin act exactly the reverse by stimulating parasympathetic action. So far, the use of drugs in dysuria is in a formative stage. Recently, Gernon, Palmer and McKenna<sup>15</sup> have reported hopeful results by using gynergen (ergotamine tartrate) 4 mgms. a day in tabetic patients. It inhibits sympathetic action giving greater expulsive force with weaker internal sphincter resistance. They point out the danger of ergotamine and possibility of relapse of tabetic bladder type function. They used mecholyl to increase parasympathetic type action in two cases of multiple sclerosis with one showing good cystometric response.

#### SPINAL CORD

To the spinal cord is attributed clinically much greater interest and speculation as to its influence on bladder function in our general work than is the brain. I doubt that such a comparison is justified. The spinal cord lends itself to graphic representation of its relationship to the sympathetic and parasympathetic nervous systems which, at the time of early efforts in cystometric work,<sup>16, 17</sup> were thought to influence the bladder specifically according to their anatomical distribution. That is, the



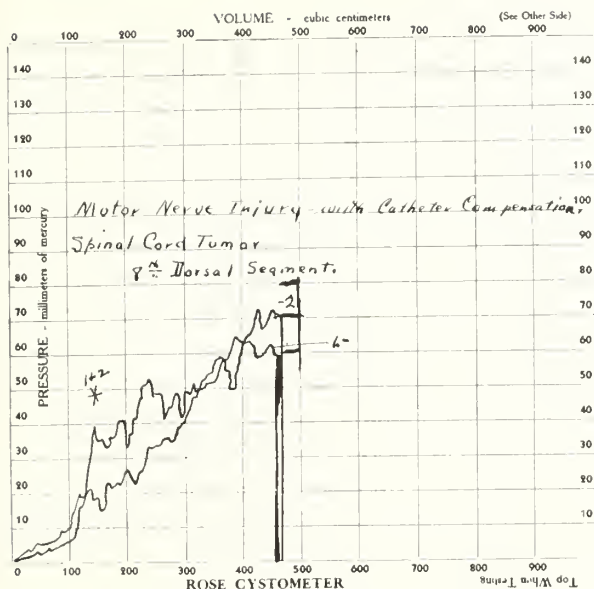


Fig. 9. Motor nerve injury with catheter compensation. This patient was able to void prior to operation at which time the dorsal column was incised in search for a spinal cord tumor at the level of the eighth dorsal spinal segment. The tumor was not found. However, after operation the patient was unable to void, probably due to hypotonia associated with spinal shock and not to posterior column damage. A retention urethral catheter was inserted and was removed some weeks later, just before making the cystometric examination. The striking thing of both curves is the paradoxical resistance of the bladder wall in that a stretch reflex occurs to many of the 15 cc. increments of water but the pressure thus gained falls again making waves of increases in pressure. With this we find curve 2 higher than curve 1 and also 70 mm. of mercury voluntary pressure in curve 2. These two points are due to the catheter compensation in a (motor) neurogenic bladder. Unfortunately it was impossible to make further cystometric studies but I believe these curves represent motor nerve injury plus catheter compensation. In my experience such neurogenic bladders compensate to a catheter much more than those with posterior root damage. This fact also suggests that the operation via the dorsal column did little damage.

parasympathetic system with outflow from the first to the fourth (chiefly the second and third) anterior sacral roots, was thought to be the bladder emptying nerves, that is, contracting the bladder and opening the sphincter. They reach the bladder through the nervi erigentes or pelvic nerve and while the sympathetic nerves were thought to be the nerves of bladder filling, that is, relax the wall and contract the sphincter, I now feel it necessary to modify these views since lesions located at the areas described as those of sympathetic and parasympathetic origin do not necessarily alter bladder function specifically. "Such opposite and exclusive functions do not occur (in other parts of the body in animals) as has been shown by many observers (Dale and Gaddum, Heinbecker and others), and in relation to the bladder by MacDonald and McCrea."<sup>3</sup> However, this division of function does occur. It simply does not coincide with anatomic division, that is, if the inferior mesenteric trunk to the bladder is cut, by no means is the so-called sympathetic action removed. Also, we have to deal with a vicarious as well as actual assumption of function by the remaining nerve fibers. Further evidence against selective action of each nerve

group is that of Eccles<sup>18</sup> showing that preganglionic stimulation can be differentiated in the ganglion to emerge through the postganglionic fibers as both stimulators and inhibitors.

#### THE SYMPATHETIC NERVES

The sympathetic nerves, from the twelfth dorsal, first and second lumbar segments, pass to the inferior mesenteric ganglion through the sympathetic trunk and thence on down to the vesical plexus through the presacral nerve, also called the hypogastric nerve. It is, therefore, through this nerve that stimuli causing bladder wall relaxation and increased internal sphincter tone were supposed to pass. Denny Brown<sup>11</sup> points out that, while stimulation of this nerve does cause contraction of the internal sphincter, this contraction depends entirely on the tension of the bladder wall with the reflex mediated through the vesical plexus. He feels that the contraction produced by direct electrical stimulation of this nerve "involves only the proximal part of what we have called the internal sphincter." He observed patients with complete

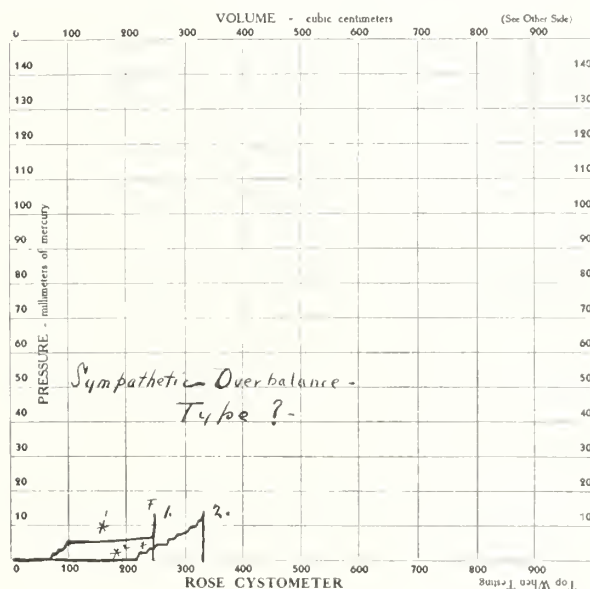


Fig. 10. It has seemed probable that congenital types of bladders exist, that is, sympathetic overbalance type (hypotonic) and parasympathetic overbalance type (hypertonic). I have reported enuresis<sup>25</sup> associated with congenital nystagmus and pin point pupils in a marked hypertonic bladder with the patient relieved by hydraulic distention, but have not found a cystometric instance of the sympathetic type. This examination was done with the expectancy of finding such a type, in this child 7½ years old, female, who voided only two or three times a day. Periodically the mother noticed that the urine had a bad odor (B. coli) and at such time there occurred a fever of from 99 to 100 F. For a short time the child voided frequently, she is given a urinary antiseptic and in three or four days the B. coli odor of the urine disappears, the fever subsides and voiding again becomes infrequent. The patient's I. Q. test is normal yet one is definitely impressed with a slowness in cerebration. Before the examination the bladder was emptied of 650 cc. of uninfected urine. The cystometrograms records definite bladder resistance, considerable fear inhibition, particularly in curve 2 and a maximum capacity of 300 cc. This suggests not a sympathetic overbalance but rather that the large capacity and infrequent voiding is due to her particular cerebration, that is, central rather than autonomic, for the evidence of the latter fails with the mental stimulation of being examined.

destruction of the sacral cord who periodically normally voided from 200 to 300 cc. of urine with no residual urine. On the other hand I cite a case with similar bladder function with the sacral cord intact but with a complete transvesical lesion of the spinal cord at the eleventh and twelfth dorsal of three years duration in which inhibition, that is sympathetic type action, can be produced by a pin prick to his glans penis or sole of the foot. This individual could not inhibit his bladder contraction by voluntary action as those with an intact central nervous system can easily do. This similarity in ultimate bladder function suggests interdependence of vesical action based on the ability of its plexus to mediate any spinal cord reflex. Obviously this is not in the nature of opposite action of sympathetic and parasympathetic nerves. The emptying is automatic depending on bladder wall tension.

Dees and Langworthy<sup>6</sup> state that if the sacral posterior roots are cut bilaterally, "Sympathectomy appeared to improve vesical function in animals in our series who survived a suitable length of time. Reflex emptying became effective and the continuous ooze of urine stopped so that the perineum was dry. Waves of contraction appeared during filling and the sphincter relaxed at low pressure. We would by no means suggest this operation as a routine therapeutic procedure in human cases. On suitable cases it might be tried."

In my opinion the continued benefit of presacral nerve resection<sup>19</sup> is extremely doubtful. The possibility of renal regurgitation and back pressure is definite and our ability not sufficiently exact to analyze vesical dysfunction on a basis of anatomical and physiological nerve alteration. The "atonic" bladder is a secondary myogenic decompensation in most instances. Dees and Langworthy<sup>6</sup> find that, "After section of the posterior spinal roots the tone is lost immediately in striated muscle supplied by these roots and the deep reflexes cannot be obtained. This immediate loss of tone cannot be demonstrated in the bladder. Successive fillings, however, increase the capacity by hydraulic distention, that is, myogenic decompensation.

Lesions of the spinal cord vary greatly in their effect on bladder function according to their rapidity of onset, that is, the associated shock, and also the degree and location, whether the injury is intradural or extradural or both. After fracture of the spinal cord there is, during a variable duration of spinal shock, a time when the bladder overdistends. In D. Denny Brown and E. Graeme Robertson's remarkable work,<sup>10</sup> "The State of the Bladder and Its Sphincters in Complete Transverse Lesions of the Spinal Cord and Cauda Equina," they point out that, "The reaction of the detrusor to stretch recovers progressively from the shock of sudden complete traumatic lesions of the spinal cord or cauda equina. The mechanism of the reaction is related only to the vesical plexus and detrusor mechanism and a peripheral reaction of reflex character must be postulated to account for it."

And further, "This reaction to stretch is enhanced when reflexly active spinal segments make full recovery from spinal shock." They think it is wholly a "vesical reflex" and that the sacral spinal segments are sufficient to cause detrusor action, the hypogastric nerves necessarily playing no part in the efferent reflex mechanism or voluntary control.

The types of lesions most frequently encountered are tumors, injuries and infections. Of the latter, violent coccal infections of the meninges produce generalized symptoms which overshadow and thus prevent any analysis of direct alteration in bladder nerve change.

#### THE PARASYMPATHETIC NERVES

From the motor standpoint we have accumulated the facts of the two long motor pathways, cortico-spinal and hindbrain-spinal pathways traveling in or near the lateral columns, of which the cortico-spinal reflex is the more important. An outflow through the anterior spinal roots is parasympathetic action, that is, detrusor action of contracting the bladder wall and opening the sphincter, and the outflow of this system is chiefly second and third sacral spinal segments.

Barrington<sup>21</sup> feels that the sixth reflex of distending the bladder and effecting a "relaxation of the plain muscle of the urethra chiefly or entirely in its proximal third," is afferent and efferent in the pelvic nerves (n. erigentes).

Moore<sup>22</sup> described tactile sensation in the bladder which Learmonth<sup>23</sup> found present after sympathetic neurectomy and therefore concluded that this type of sensation is afferent in the parasympathetic nerves. We think of the anterior root as predominately motor-parasympathetic possessing both afferent and efferent fibers to permit spinal and cortical reflexes.

Lewis, Langworthy and Dees<sup>20</sup> point out that injury to the motor pathways renders consequent frequent small amplitude waves of bladder contraction ineffective in emptying the bladder. This coincides with the usual clinical finding that the automatic bladder frequently carries a residual urine.

#### THE PUDIC NERVE

We have in the n. pudendal or pudic nerve the one skeletal nerve voluntarily functional in urination. It arises from the anterior primary divisions of the second, third and fourth sacral nerves and carries sensory fibers from the external sphincter and prostatic urethra. It also innervates the circular sphincter muscle and transverse perineum muscle within the triangular ligaments as well as the bulbocavernosus and ischiocavernosus muscles, the pelvic sling and voluntary anal sphincter, and is sensory to the adjacent skin. It is also sensory to the dorsum and glans penis and mons pubis. It may carry autonomic fibers. From the clinical standpoint it coordinates anal sphincter, perineal muscles and voluntary or external bladder sphincter.



When Barrington<sup>24</sup> cuts both pudic nerves, incontinence results. This incontinence, however, increases if secondarily the pelvic (parasympathetic) nerves are cut. They are, therefore, supplemental in their action. Both he and Oswald Schwarz<sup>25</sup> feel that the emptying jets of urination are made possible by the action of the pudic nerve. We well know that an attempt to pass a cystoscope upon a resisting patient meets an obstruction midway in the prostatic urethra. We sense that the internal sphincter has been pulled upward or anterior and in order to meet this difficulty we depress the ocular part of the instrument providing the patient will not relax. By this movement, we lower the distal prostatic urethra and aim upward to enter the spastic upward angulation of the proximal prostatic urethra. Further, in support of this view, one depresses the perineum to initiate urination and elevates it to resist involuntary contraction of the bladder, that is, to prevent incontinence of urgency. This latter movement may be supplemented by adducting the thighs which fixes the perineum in elevation. Just how these movements affect the prostatic urethra is not entirely clear but in some textbooks of anatomy a levator prostatae muscle innervated by the n. pudendal is described. This muscle, a part of the pelvic sling, does not surround the prostate but its fascia blends with that of the prostatic capsule. Further, we find that the normal prostate does not envelop the entire so-called prostatic urethra. From the apex of the prostate to the superior fascia of the urogenital diaphragm there is a short distance of free or mobile urethra which would allow the described movement to occur.

The compressor action of the voluntary muscle within the urogenital diaphragm is not sufficient to withstand the high intracystic pressures that we have found in neurogenic bladders which have a spastic, that is, obstructive, external sphincter. It is interesting to attempt a diagnosis of pudic nerve neuritis. Cystometrically two proven cases were due to an extradural involvement of the second and third anterior sacral roots: (1) metastatic tumor, and (2) tuberculomata. In both cases the posterior urethra was spastic, held tightly at an upward angle and, upon entering the bladder, a high intracystic pressure was encountered. The anal sphincter and perineal muscles showed increased tone. The bladder was so firm suprapubically that it was described as a "ball bladder." Tolerance in such an instance to such a pressure was a type of "pressure anaesthesia" or "physiological adaptation." Increased pudic nerve irritability, when stimulated by urethral instrumentation, reflexly inhibits bladder pressure to the extent that I have encountered negative bladder pressures with extremely small capacities associated with severe urethral pain on cystometric examinations. These were in cases of acute urethritis.

Guyon,<sup>26</sup> in 1900, and Barrington,<sup>21</sup> in 1914, agree that running water through the urethra reflexly

causes its relaxation (a spinal reflex) with both afferent and efferent pathways in the pudic nerve, and also when, as a result of this running water, the bladder contracts, the afferent pathway is in the pudic nerve and the efferent pathway in the pelvic nerve. In diabetic or alcoholic neuritis, the nerve involvement is varied, the stronger influence overshadowing the weaker. We can determine the bladder changes which are producing the symptoms and so institute suitable bladder management without an accurate opinion as to the spread of nerve involvement. As in all neurogenic bladders, the diagnosis belongs to the neurologists and we hope to explain our symptoms on their findings, but the neurologist's diagnosis does not offer a *modus operandi* of bladder management. That must be based on the individual alteration in bladder function.

Terms such as tabetic, paralytic, cord, neurologic and atonic<sup>27</sup> bladders carry no indication of a specific alteration in neurophysiology. Clinical application from a diagnostic standpoint can best be made by analysis of representative cystometrograms incorporating in each discussion the basis for treatment.

#### INFECTION

The interdependence of infection and bladder function has been discussed many times and is generally accepted in principle. It is based on local tissue immunity which, in a mobile receptacle capable of self-trauma by pressure or direct contact of surfaces, can definitely interfere with the development of this immunity. The bladder normally, in passive or active state, does not exhibit undue speed and force of muscle contraction. However, in a bladder contracted by frequency of urination, secondary to local infection or reflex irritability or by release of inhibition, there is perfect drainage of urine and infection but a high degree of absorbability via the bladder or urethral surfaces which are suffering trauma secondary to increased force of muscular contraction. Often such bladders are contracted more and their surfaces traumatized by instrumental drainage thereby markedly increasing absorption. This is particularly true if the residual urine persists after the catheterization. In such an instance the infection may spread by ureteral regurgitation or by the lymphatics or the blood stream. One should manage the individual bladder so as not to increase the bladder wall spasm lest by doing so its increased expulsive force will overcome the obstruction and so give perfect drainage. Infections of long duration and low virulence may elude this principle but usually it accounts for the "urethral chills," i. e., diffusions of bladder and urethral infections.<sup>28</sup> This situation may occur in prostatic obstruction, of course, and equally so in neurological obstructions, that is, normal wall with spastic voluntary sphincters. On the other hand, when a residual urine occurs as a result of low bladder wall tone due to a break in a

reflex arc, the duration, degree and associated intracystic pressure may make our decision diametrically the opposite. In such a bladder, in *tabes dorsalis* for example, the absorbability of the urinary mucosa is poor which, associated with a low intracystic pressure, gives practically a nonabsorptive organ. Furthermore, its tone recovers but little either on intermittent or continuous catheterization.

#### SPINA BIFIDA

As previously discussed, the bladder can empty itself in certain instances when the sacral cord is completely destroyed leaving only the hypogastric nerve and vesical plexus. In spina bifida of various degrees we find all types of bladder dysfunction. McCarroll<sup>29</sup> classifies them "according to the status of the two involuntary muscle components (detrusor muscle and internal sphincter) and voluntary sphincter. Any combination between these muscle components is found," and "careful cystometric studies make possible an accurate classification of the physiological conditions encountered." His treatments, which were unusually successful, were based upon these findings. Hydraulic distention increased capacity. I find that this is true cystometrically but that the intracystic pressure is not decreased although the capacity increased which suggests that one of the effects of hydraulic distention is training inhibition.

The work of Langworthy and Dees,<sup>30</sup> "The Study of Bladder Disturbance in Spina Bifida," states that, "It is possible to distinguish predominant involvement of the posterior or sensory sacral roots from that of the anterior or motor roots." They base their conclusions on the type of vesical wave studied with a water cystometer. "Damage to the anterior roots carrying parasympathetic fibers removes all nervous control except from the sympathetic supply and the intrinsic nerve plexus. Small rhythmical waves of contraction show little summation and are not maintained so there is no adequate force to empty the bladder. If the damage to the parasympathetic nerves is slight, the bladder functions more perfectly presenting a better fusion of the contraction waves and a more sustained contraction." Posterior root damages cause changes similar to a tabetic bladder, "symptoms of hesitancy and retention."

If both posterior and anterior roots are cut bilaterally, "The muscle is coordinated by the peripheral ganglia and nerve plexus. The sympathetic pathway is intact but appears to have no part in emptying the bladder." "Immediately after the operation, tone is lost in the vesicle muscle, the bladder volume increases and urine escapes only by overflow. The increase in volume is never as great as after section of the posterior roots alone. . . . Within ten days the bladder volume decreases to its normal capacity."

These findings furnish a neurological basis for considering therapy on a myogenic basis of hydraulic distention or outlet dilatation. Cystometri-

cally I have found certain bladders far more tractable to such distention and dilatation than others, particularly those with a preponderance of damage on the motor side.

#### POSTOPERATIVE AND POSTPARTUM BLADDERS

We have transient neurogenic bladders in postoperative and postpartum<sup>31</sup> retentions. In considering the postoperative, it is necessary to allow for anaesthesia, position in bed, psychic retention often associated with overdistention of the bladder by intravenous or subcutaneous fluids; but these factors are not enough in some instances, particularly those in which the retention lasts for several days. In these, we find cystometrically a low pressure and involuntary inhibition with normal sensations. We have ample proof of an inhibitory reflex possible in the sacral cord and on this basis feel that the postoperative inhibition is reflex from the operative wound. The reason anal and perineal surgery has a high percentage of postoperative retention is the association of this region with the initial depression of the perineum necessary to institute voiding. Anticipation or fear of pain by this movement would invite additional cerebral inhibition and eventually allow sensory adaptation to the residual urine.

Not only can this inhibition occur with extracystic surgery or trauma, but in certain individuals repeated bladder manipulation associated with pain will invite subconscious inhibition and retention and actual residual urine of small amounts.

A postpartum bladder may fall into the category of the postoperative, that is, inhibition secondary to trauma or surgery of delivery. In some instances, however, we find a marked resistance of the bladder wall to distention associated with a definite diminution in sensibility and a urinary retention secondary to a transient faulty innervation involving the internal sphincter. Long bladder compression may cause this change in its adaptation. The pudic nerve on the inner surface of the spine of the ischium, or other nerve supply in the sacral region, could be subjected to pressure and so temporarily block normal bladder innervation. The cystometrogram suggests a motor and sensory block in that the bladder reacts to stretch but the contraction waves do not fuse to form a complete detrusor action and, with this, there is a definite degree of anaesthesia. In this type of retention, we believe in maintained decompression of the bladder by a retention urethral catheter rather than intermittent emptying or cystoscopic examination with ureteral catheterization. Either manipulation would increase the myogenic reaction but would not relieve the neurogenic block and would, therefore, not furnish adequate drainage but would tend to disseminate the infection.

#### POLIOMYELITIS

In Wright's cystometric studies<sup>32</sup> of poliomyelitis dysurias, he attributes the "immediate urinary dys-



function to a peripheral neuritis—in a few it appears to be central.” He presents cystometrograms showing hypotonia with normal and with absent sensation and with normal or absent voluntary pressure, the latter dependent upon the status of the abdominal wall. We feel that manual abdominal pressure in certain bladders only excites involuntary smooth muscle detrusor action. However, in certain paralytic abdominal walls, unilateral or bilateral, the amount of direct abdominal pressure by hand may register on the intracystic pressure.

In this regard Gordon Holmes<sup>33</sup> quotes Head and Riddock:<sup>34</sup> “The importance of abdominal spasm in exciting reflex micturition is well illustrated in a case in which scratching the right sole excited flexor spasms of the right leg—and a strong contraction in the right half of the abdomen with evacuation of the bladder” while on similar scratching of the left sole, “the reflex movement was violent but there was little or no movement of the abdomen,” and “the energy evoked could not materially affect the activity of the bladder.”

The association of degree of bladder wall tone and state of abdominal muscles determines the result of manual expression of urine. In general, high cord injuries allow better results by this type of treatment than do sacral cord injuries. These results may be produced by direct hand pressure or by excitation of detrusor action either by the pressure or simply by the skin stimulation incidental to this pressure.

#### SUMMARY

Detrusor action of the bladder is activated by filling, the stretch reflex. This action is normally inhibited by the cerebrum and hindbrain; their fibers, motor and sensory, travel in the lateral columns of the spinal cord. The sacral cord supplies outflow for this inhibitory influence. It also supplies outflow for motor fibers via the anterior spinal roots, for some sensory fibers via the posterior spinal roots and for the n. pudendus, supplying the perineal muscles and the external or voluntary bladder sphincter.

The autonomic system (sympathetic via the hypogastric or presacral nerve and parasympathetic via the pelvic nerve or nervi erigentes) is differentiated functionally rather than by anatomical division. The vesical plexus as well as the sacral cord mediates various afferent impulses and is important in the development of automatic bladders.

Cystometric examinations enable us to differentiate types of function, alterations in associated contraction or relaxation of the bladder wall and sphincters and to establish clinically the relationship between myogenic and neurogenic components.

The myogenic factor, that is, the action of the bladder wall with its vesical plexus divorced from specific higher innervation, is most important in cystometric diagnosis. It is particularly influenced by sphincteric resistance, by catheterization either

intermittent or continuous, by infection or by the state of cerebral inhibition.

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#### BIBLIOGRAPHY

1. Belfield, W. T.: Prostatic Myoma—a So-called “middle lobe” of the Hypertrophied Prostate Removed by Suprapubic Prostatectomy, *J. A. M. A.* **8**:303 (March 12) 1887.
2. Denny Brown, D., and Graeme, Robertson: On the Physiology of Micturition, *Brain* **56**:149-190, 1933.
3. Parker, M. Murray, and Rose, D. K.: Inhibition of the Bladder, *Arch. Surg.* **34**:828-838 (May) 1937.
4. Langworthy, O. R.; Lewis, Lloyd G., and Dees, J. E.: Behavior of Human Bladder Freed From Cerebral Control, *J. Urol.* **36**:577-597, 1936.
5. Langworthy, O. R.: The Control of Tonus After Injury to the Brain and Spinal Cord of Man, *Medicine* **11**:225, 1932.
6. Dees, J. E., and Langworthy, O. R.: An Experimental Study of Bladder Disturbances Analogous to Those of Tabes Dorsalis, *J. Urol.* **34**:359-371, 1935.
7. Watts, Jas. W., and Uhle, Chas.: Bladder Dysfunction in Cases of Brain Tumor. A Cystometric Study, *J. Urol.* **34**:10-30, 1935.
8. Frazer, C. H.: A Clinical Survey of Seventy-Eight Verified Tumors of the Frontal Lobe. Read before the Section of Nervous and Mental Diseases of the American Medical Association, Milwaukee, June 14, 1933.
9. Barrington, F. J. F.: The Localization of the Paths Subserving Micturition in the Spinal Cord of the Cat, *Brain* **56**:126, 1933.
10. Denny Brown, D., and Graeme, Robertson: The State of the Bladder and Its Sphincters in Complete Transverse Lesions of the Spinal Cord and Cauda Equina, *Brain* **56**:397-463, 1933.
11. Denny Brown, D.: Nervous Disturbances of the Vesical Sphincter, *New England J. Med.* **215**:647-652 (Oct. 8) 1936.
12. Simons, Irving: Studies in Bladder Function, *J. Urol.* **35**:96-102, 1936.
13. Simons, Irving: Cystometry, a Critical Review With Special Reference to Micro-cystometry and Sphincterometry, *Brit. J. Urol.* **9**:132-152 (June) 1937.
14. Rose, D. K., and Deakin, Rogers: A Cystometric Study of the Pharmacology of the Bladder, *Surg. Gynec. & Obst.* **221**:226 (February) 1928.
15. Gernon, J. T.; Palmer, E., and McKenna, Chas. M.: Some Recent Developments in the Treatment of Neurogenic Dysfunction of the Bladder, *J. Urol.* **35**:515-519, 1936.
16. Rose, D. K.: Determination of Bladder Pressure With the Cystometer, A New Principle in Diagnosis, *J. A. M. A.* **88**:151 (Jan. 15) 1927.
17. Muschat, Maurice: The Value of Cystometry, *J. Urol.* **33**:366-387, 1935.
18. Eccles, J. C.: *J. Physiol.* **85**:209, 1935.
19. Learmonth, J. R., and Braasch, W. F.: Resection of the Presacral Nerve in the Treatment of Cord Bladder, *Surg. Gynec. & Obst.* **51**:494-499, 1930.
20. Lewis, Lloyd G.; Langworthy, O. R., and Dees, J. E.: Bladder Abnormalities Due to Injury of Motor Pathways in the Nervous System, *J. A. M. A.* **105**:2126-2132, 1935.
21. Barrington, F. J. F.: The Component Reflexes of Micturition in the Cat, *Brain* **54**:177-188, 1931.
22. Moore, T. D.: Bladder Sensibility, *Arch. Surg.* **9**:176-187, 1924.
23. Learmonth, J. R.: A Contribution to the Neuro-Physiology of the Urinary Bladder in Man, *Brain* **54**:147-176, 1931.
24. Barrington, F. J. F.: *J. Exper. Physiol.* **8**:33-71, 1914-1915.
25. Schwarz, Oswald: In Von Lichtenberg, A. Voelcher, F., and Wildbolz, H.: *Handbuch der Urologie*, Berlin, Springer, 1928.
26. Guyon, J. F.: *C. R. Soc. Biol.*, Paris, 712, 1900.
27. Rose, D. K., and Deakin, Rogers: The Cystometric Diagnosis of Central Nervous System Syphilis, A New Appreciation of the Term Neurogenic Bladder, *Am. J. Syph.* **13**:371 (July) 1929.
28. Rose, D. K.: Changes in the Wall of the Bladder Secondary to Prostatic Obstruction, Their Significance in Prostatic Surgery, *Arch. Surg.* **25**:783-795 (October) 1932.
29. McCarroll, H. R.: Spina Bifida Urinary Incontinence, A Report of Cystometric Studies in a Series of Thirty Cases With Some Suggestions Regarding Their Clinical Management, *Surg. Gynec. & Obst.* **64**:721-737 (April) 1937.
30. Langworthy, Orthello R., and Dees, John E.: A Study of Bladder Disturbances in Spina Bifida, *J. Urol.* **35**:213-226 (February) 1936.
31. Rose, D. K., and Rollins, Paul R.: Pyelonephritis in Pregnancy, Its Treatment and Prevention Based on Cystometric Conclusions, *J. A. M. A.* **96**:235-240 (Jan. 24) 1931.
32. Wright, Burnett, W.: Urinary Complications in an Epidemic of Poliomyelitis, *J. Urol.* **35**:618-629 (June) 1936.
33. Holmes, Gordon: Observations on the Paralyzed Bladder, *Brain* **56**:383-396, 1933.
34. Head, H., and Riddock, G.: *Brain* **40**:188, 1917.
35. Rose, D. K.: The Present Status of Cystometry, *J. A. M. A.* **107**:1534-1536 (Nov. 7) 1936.

## SYMPOSIUM ON MATERNAL WELFARE

## MATERNAL MORTALITY IN MISSOURI

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In comparatively recent years increasing interest has been shown in statistics, especially those pertaining to infant and maternal death rates. The purpose of this article is to describe briefly the recent trends in maternal mortality and related subjects in Missouri and explain the method by which these statistics are collected, classified and compiled.

During the last twenty-eight years over 10,000 women in Missouri have lost their lives from puerperal causes. Although the decline in the birth rate has reduced the annual number of puerperal deaths, the maternal mortality per 1,000 live births decreased but slightly during this period until 1938. For that year the maternal death rate was 3.82 per 1,000 live births, the lowest ever to be recorded in Missouri and almost half the rate of 1911, the earliest year for which statistics are available in this state. The accompanying table gives the trend in live

births, infant and maternal mortality in Missouri for the years 1911 to 1938 inclusive.

A comparable reduction has occurred in the infant mortality rate for Missouri as well as for the United States as a whole. Detailed analysis of causes of death and related conditions in the United States shows that the greatest gains in this field have come through reduction of diarrhea and enteritis and other infectious diseases. These gains are believed to be due to improved medical care and increased public health attention to problems of infant and maternal health. The public health activities in Missouri, although largely educational in nature, include an extensive milk sanitation program designed to bring about a reduction in the deaths from infectious diseases. The early infant deaths which are due in large part to congenital conditions and accidents of birth are far more difficult to control. Waste of life through miscarriage, stillbirths and associated problems of maternal mortality still present a challenging field for medical research and organization.

Dr. Edwin F. Daily, Chief of the Maternal and Child Health Division of the Children's Bureau, states that "the American Committee on Maternal Welfare composed of representatives of national, public and private organizations interested in maternal and child health have pointed out the great need for additional medical information with respect to all births (live and still). For the reduction of mortality connected with birth, accurate information must be available with respect to prenatal and natal conditions. This information is necessary not only for the reduction of fetal and infant death rates, but also for the reduction of the maternal death rate and for the improvement of maternal and child health."

The value of statistics of natality and mortality is unquestioned and their use in planning a public health program is essential. The source of these statistics is familiar to every physician, i.e., birth and death certificates, dependent for their accuracy and completeness of information upon the physician or other person in attendance. It is evident that vital statistics cannot be more accurate or more complete than the original certificates upon which they are based.

Table 1. *Live Births, Infant and Maternal Mortality in Missouri; 1911-1938*

Year	Live Births		Infant Deaths		Maternal Deaths	
	Number	Rate	Number	Rate	Number	Rate
1911	74,130	22.42	7050	95.10	574	7.74
1912	75,452	22.74	6716	89.01	546	7.24
1913	75,231	22.59	7120	94.64	584	7.76
1914	73,925	22.12	6495	87.86	400	5.41
1915	71,543	21.34	5564	77.77	393	5.49
1916	73,486	21.84	6047	82.29	418	5.69
1917	67,041	19.86	4413	65.83	401	5.98
1918	64,001	18.90	4046	63.22	357	5.58
1919	61,193	18.01	5064	82.75	287	4.69
1920	65,416	19.16	5449	83.30	280	4.28
1921	66,970	19.48	4531	67.66	339	5.06
1922	64,388	18.61	4372	67.90	432	6.71
1923	66,691	19.16	4933	73.97	426	6.39
1924	68,961	19.69	4827	70.00	387	5.61
1925	68,293	19.37	4745	69.48	368	5.39
1926	66,611	18.78	4745	71.23	409	6.14
1927	66,401	18.61	3984	60.00	420	6.33
1928	63,401	17.66	4167	65.72	406	6.40
1929	60,980	16.88	3826	62.74	420	6.89
1930	62,011	17.00	3617	58.33	358	5.77
1931	60,201	16.24	3803	63.17	413	6.86
1932	59,755	15.83	3429	57.38	367	6.14
1933	57,717	15.13	3281	56.85	298	5.16
1934	60,317	15.59	3756	62.27	353	5.85
1935	57,299	14.64	3262	56.93	324	5.65
1936	55,916	14.12	3235	57.85	342	6.12
1937	57,270	14.36	3258	56.89	294	5.13
1938	59,365	14.88	3032	51.07	227	3.82

Rates: Live Birth Rates are per 1,000 estimated population. Infant and Maternal Mortality Rates are per 1,000 live births. Source: 1911-1934, 1937 and 1938, Vital Statistics Reports of the Missouri State Health Department. 1935 and 1936, Special Reports of the U. S. Bureau of the Census.



Death certificates received in the State Division of Vital Statistics must be classified for cause of death before any statistical analysis can be made. No registration office that deals with a considerable number of returns of death can present a compilation in which each individual cause will be shown. The number of medical terms employed by physicians is so great that a table prepared on this basis would be chiefly a list of names of diseases. The length of such a list would preclude the presentation of important statistical relations of the various causes and the number of deaths returned for the less common terms would be too few to render results of statistical value. A process of condensation or consolidation is therefore necessary in compiling causes of death. The "Manual of the International List of Causes of Death" has been prepared for this purpose. It is an arbitrarily selected list of titles, and under each title are the various terms agreed upon to be included under that title in classification. Originally proposed in 1893, the International List has been revised each decade to conform with advancements in medical science. It was adopted by the United States in 1900 and is now used in practically every country which publishes statistics on causes of death. It is now a matter of routine in every state health department that each death certificate is coded according to this list for the cause of death.

Section XI of the International List, entitled "Diseases of pregnancy, childbirth and the puerperal state," is devoted entirely to maternal deaths. The term "puerperal" is intended to include pregnancy, parturition and lactation. Whenever parturition or miscarriage has occurred within one month before death of the patient, the fact should be certified even though childbirth may not have contributed to the fatal issue. Whenever a woman of childbearing age, especially if married, is reported to have died from a disease which might have been puerperal, the physician is requested to make an explicit statement as to whether the disease was or was not puerperal in character. The new standard death certificate recently adopted in Missouri adds the statement "Include pregnancy within 3 months of death" in an attempt to elicit more complete reporting of puerperal causes. The value and completeness of maternal mortality statistics can be greatly improved by cordial cooperation between the medical profession and the registration officials.

Vital statistics, being but a numerical classification or analysis of the recorded events, depend primarily for their usefulness upon the accuracy of the original records of facts, i.e., birth and death certificates. They depend secondarily upon the accuracy of the statistical classification and compilation and finally upon their proper presentation and interpretation. In comparing the state of health of a community at present with preceding years and this community with other communities one cannot use figures giving the total volume of

births, deaths or deaths from selected causes. Therefore the first requisite to the proper presentation of vital statistics is some unit of population upon which to base comparisons. The numerical expressions of facts regarding births and deaths in terms of the same unit of population are called rates.

Comparisons between the death rates from separate causes, whenever possible, should be based on the population exposed to the risk of death from each cause. A death rate from puerperal causes should be based upon the total number of women who were in a puerperal state, or the number of live births plus the number of stillbirths, miscarriages and abortions. While a maternal mortality rate based on that figure would be the most accurate because it would include all those mothers exposed to the risk of childbirth, it is not in common use. Its use is prohibited by the deficiency in stillbirth reporting, the confusion in the definition of a stillbirth and the absence of any statistics on miscarriages and abortions. The risk of childbearing or the maternal mortality rate is therefore usually measured by the annual number of puerperal deaths per 1,000 live births. For example, in Missouri during 1938 there were 227 deaths from puerperal causes and 59,365 live births making a maternal mortality rate of 3.82 or almost four maternal deaths per 1,000 live births.

Infant mortality rates are computed by the same method, the number of deaths under 1 year of age per 1,000 live births. Infant mortality rates might be based upon the number of births during the preceding year or upon the average of the number of births of the current year and the preceding year. However, the number of births of the current year has been accepted as the most satisfactory basis in Great Britain, the United States and many other countries.

The dependence of maternal and infant mortality rates upon birth registration is unfortunate in a way because of the influence of defective registration. The most unfortunate fact is that there is no reliable check by which the failure to register births can in all cases be detected. In 1934 a test of birth registration was made in Missouri and the state average deficiency of reporting was between 13 and 15 per cent, with some counties showing as high as 50 per cent deficiency. The test was the usual method employed by the United States Bureau of the Census. Franked post cards were placed in every mail box in the state asking for the name of any child born during the previous twelve months. The cards were then returned to the State Health Department where they were checked against certificates on file. The results showed that of the 114 counties only fifty-three (less than half) showed the state average of 87 per cent complete registration or better and thirty-four counties showed less than 80 per cent completeness. It is interesting to note that according

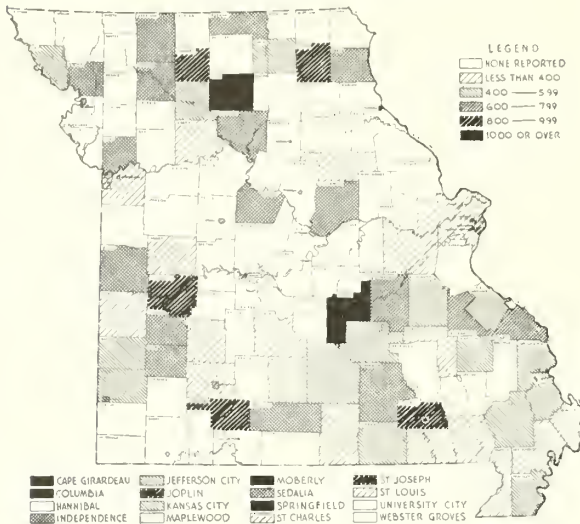
MATERNAL MORTALITY IN MISSOURI 1938  
DEATHS FROM PUERPERAL CAUSES PER 1000 LIVE BIRTHS

Fig. 1.

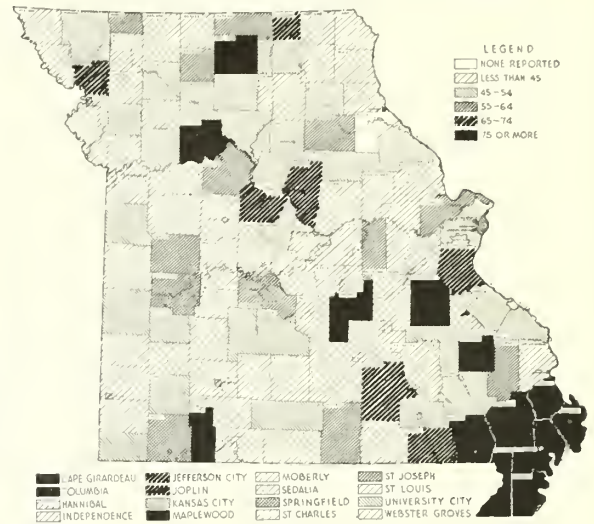
INFANT MORTALITY IN MISSOURI 1938  
DEATHS UNDER 1 YEAR OF AGE PER 1000 LIVE BIRTHS

Fig. 2.

to this test, the counties with the poorest registration are those of the lowest economic status. These counties also are marked with a scarcity of qualified physicians and a majority of the births are attended by midwives. This scarcity of physicians and prevalence of midwives in certain areas is regrettable; however if less time were spent in lamentation and more in tolerance and education of midwives some improvement in birth registration as well as infant and maternal mortality rates might be accomplished. With the knowledge that many of the midwives attending births in the rural areas are not licensed, the State Health Department is conducting a survey of these midwives in an attempt to secure more complete birth registration and obtain a better knowledge of the number practicing in the state and the character of the service they render.

The accompanying maps show the infant and maternal mortality rates in Missouri by counties and cities over 10,000 population for 1938. However these rates should be studied with caution and realization of the discrepancies likely to be present in county rates necessarily based upon such small numbers. In order to facilitate interpretation the rates have been grouped and the areas shaded accordingly.

Stillbirths are not included in infant mortality. The reporting of stillbirths in this state as well as in other areas always has been considered extremely deficient. The recent adoption of the new single stillbirth form is considered desirable as a step toward improving stillbirth registration and securing causes of stillbirth. It also will eliminate duplication of work by the attending physician. The absence of a generally accepted definition of a stillbirth is another inaccuracy in these statistics. Missouri requires the reporting as a stillbirth of any child born dead after a period of five months gesta-

tion. If the child breathes at all it must not be recorded as a stillbirth but as a live birth. Dr. Milton J. Rosenau in "Preventive Medicine and Hygiene" states that "For purposes of vital statistics, abortion includes fetuses up to four months of pregnancy; miscarriage, between four and six months; premature births from six months (the age of viability) to fetal maturity."

Although the infant and maternal mortality rates in Missouri have declined considerably in the last twenty-eight years, they still remain major public health problems of humanitarian, social and economic significance. One aim of the State Division of Vital Statistics is to provide accurate and reliable statistics which will present a picture of health conditions in this state at present as compared with the past and with other areas. To make dependable vital statistics the original certificates from which they are derived must be true and complete, the classification and compilation must be accurate and the presentation must be clear and easily understood. Close cooperation between the physician, other persons in attendance and registration officials will do much toward accomplishing this goal.

State Board of Health.

#### BIBLIOGRAPHY

- Rosenau, Milton J.: Preventive Medicine and Hygiene, 1927.
- DePorte, J. V.: The Theory and Practice of Vital Statistics, Bulletin, A Series of Talks to Public Health Officers in the New York State Health Department, 1926.
- Dublin, Louis I., and Lotka, Alfred J.: Twenty-five Years of Health Progress, 1937.
- National Resources Committee: The Problems of a Changing Population, May, 1938.
- U. S. Bureau of the Census: Manual of the International List of Causes of Death, 1929.
- U. S. Bureau of the Census: Revised Standard Birth, Death and Stillbirth Certificates, Vital Statistics Special Reports, 7, No. 11, 1939.
- Missouri State Health Department: Annual Reports for 1937 and 1938.



## HYPEREMESIS GRAVIDARUM

AN ENDOCRINE APPROACH TO EARLY TREATMENT

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Clinical and laboratory investigations in recent years have added much to the knowledge of the nausea and vomiting frequently encountered during the first trimester of pregnancy, and perhaps have brought closer an understanding of its cause. However, the final answer to this interesting question still has not been found. Because the condition seems to have many of the symptoms observed in various types of ovarian hypofunction and because encouraging results have been obtained in the treatment of five cases of pernicious vomiting of pregnancy on an endocrine basis, these findings are presented as a preliminary report pending the acquisition of sufficient additional clinical information from which definite conclusions may be drawn.

Schneider<sup>1</sup> and Hawkinson<sup>2</sup> have listed, independently, the following subjective and objective symptoms as having been observed in cases of ovarian hypofunction during the reproductive period and associated with the menopause: exhaustion, insomnia, nervousness, irritability, vaginal irritation and itching, emotional instability, weeping, depression, disturbing dreams, headache, nausea, backache, leg pains, dizziness, skin eruptions, fatigability and lassitude, fatigue on awakening, worry over trivial matters, numbness and tingling in the extremities and flushes or chills. Numerous patients suffering from the milder forms of nausea or nausea and vomiting during the early weeks of pregnancy complain bitterly of many of these discomforts. Some of the symptoms may be present prior to the advent of pregnancy and are accentuated; while in other cases they do not develop until after the first menstrual period has been missed. A few instances have been noted in which the patient would suspect a pregnancy before her next period was due because of a feeling of increased exhaustion, lassitude, nervousness and irritability, while others develop symptoms between the fourth and eighth weeks of pregnancy. Moreover, one occasionally finds a patient who suspects that she is pregnant simply because she feels so much better than usual after gestation supervenes and it is rather striking that these patients, so far as we know, do not give a history of ever having suffered from any form of nausea or vomiting during pregnancy. After having observed these facts repeatedly in various types of patients, the possibility of an ovarian deficiency being responsible for the advent of nausea and vomiting of early pregnancy suggested itself.

Schneider<sup>3</sup> has summarized the physiology of

reproduction in the following manner: The function of the pituitary is to produce a follicle stimulating hormone which acts upon the ovary in such a manner as to aid in the development and maturation of the graafian follicle. The follicle in turn is responsible for the production of estrin until ovulation occurs. At this time the luteinizing hormone of the anterior pituitary causes luteinization of the ruptured follicle with resultant formation of the corpus luteum. The corpus luteum continues to produce estrin and in addition begins the production of progesterone which contributes to the action begun by estrin and is essential in the preparation of the endometrium for implantation of the fertilized ovum, also in the formation of adequate placentation. When pregnancy supervenes the corpus luteum persists. As the placenta develops it begins the production of hormones, the functions of which apparently are to serve as an adjunct to those of the ovary and pituitary in maintaining the integrity of the pregnancy. Among the first hormones to be produced is prolactin (the anterior pituitary-like hormone) which appears in the urine in recognizable quantities as early as the third week after fertilization takes place. During the early weeks of pregnancy large amounts of prolactin and only small amounts of estrin and progesterone are produced. ("We think this is probably because their production at this time depends to a very great extent, if not entirely, upon the functional efficiency of the ovary.") At the end of three months the relationship between estrin, progesterone and prolactin is reversed and a predominance of estrin and progesterone over prolactin usually occurs. It is also at this time that the ordinary or uncomplicated type of nausea and vomiting of pregnancy ceases spontaneously.

LeGrand<sup>4</sup> has demonstrated that in women suffering from hyperemesis gravidarum there is a large quantity of gonadotropic hormone existing in a free state in the maternal blood in addition to the amount that is absorbed by the serum proteins of the blood in cases of normal pregnancy. It seems reasonable to assume that this is the result of excessive pituitary stimulation and is prompted by an existing deficiency in the function of the ovary; also, that it persists until placental development has progressed to the point where it can compensate for this deficiency. That the placenta is responsible for the production of large quantities of estrin is suggested by, first, a gradual increase in blood estrogen levels from early to late pregnancy with a sharp rise usually occurring between the fourteenth and twentieth weeks (Ra-

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koff<sup>4</sup>); second, by the fact that there is a rapid disappearance of both estrin and prolactin from the blood and urine within from twenty-four to seventy-two hours after delivery. Giest and Salmon<sup>7</sup> have shown that by the administration of adequate amounts of estrogen, the hyperactivity of the pituitary can be reduced. These observations seem to point out an ovarian insufficiency existing in those cases of early pregnancy that are complicated by the usual morning sickness or nausea and vomiting.

Pathological changes noted in cases of hyperemesis gravidarum are not characteristic of this condition alone. On the contrary they are the result of severe dehydration, acidosis and starvation. Sheehan,<sup>10</sup> in his monograph on the pathology of hyperemesis gravidarum, says that lesions found in patients who die are the results of vomiting and lack of food. There is evidence of loss of weight although no great emaciation is present. Atrophy of the heart is in proportion to the duration of vomiting. The kidneys frequently show fatty degeneration of the tubules, which is dependent upon the severe acidosis that persists for a few days before death. It is not present if adequate amounts of glucose have been given. The liver may show a fatty infiltration in the center and sometimes in the periphery of the lobules which seems to be due to a mobilization of body fat resulting from starvation.

It seems logical to assume, therefore, that the persistence of nausea and vomiting during pregnancy depends to some extent upon the constitutional changes produced in the body as a whole rather than upon the etiological factor or factors responsible for the onset of this condition. If such is true, then two distinct types of treatment should be employed: first, specific endocrine therapy designed to correct the existing ovarian deficiency and, second, adequate supportive treatment by which dehydration, acidosis and starvation may be corrected if they are present. Therefore, this treatment should be instituted *in addition* to endocrine medication.

The ovarian deficiency may be responsible for an insufficient amount of estrin or progesterone or both in the maternal blood. Many of the symptoms mentioned were elicited in each of the five cases treated for this condition. Hence, treatment was first established on the basis of an existing estrin deficiency. A small dose (500 to 600 international units) of estrogenic hormone was given hypodermically on the first day. It was increased each day thereafter in proportion to the patient's response to the previous dose until nausea and vomiting ceased and symptoms disappeared or were definitely improved. When this point was reached, a maintenance oral dose based upon hypodermic administration was determined in proportion to the minimum number of international units required to bring about a definite improvement in the condition. An accurate determination of indi-

vidual requirements was necessary before maximum relief could be obtained. The plan developed by Schneider<sup>9</sup> in his treatment of other types of ovarian deficiency cases was followed. He suggests oral therapy of from 3,000 to 24,000 units of amniotin to be given daily in capsule form in divided doses when the daily parenteral requirements have ranged from 1,000 to 10,000 units. If the requirements range from 500 to 1,000 international units, an oral preparation of lower potency is indicated. In that case the patient is placed on from 150 to 800 biological units of Progynon—DH (Schering) in 50 or 200 units tablets. Daily requirements of 300 units or less indicate the presence of a mild deficiency, in which case Collip's emmenin is used in tablet or liquid form, giving either one tablet or its equivalent, 1 dram of the liquid preparation, three or four times daily. The only way in which this plan was modified was to employ oral preparations of lower potency in those cases whose daily parenteral requirement was 600 units or less. If it was less than 300 units daily, 1 or 2 drams of liquid emmenin were prescribed in divided doses.

When the patient did not respond to the first injection within four hours and her condition remained unchanged, the next dose was increased, usually doubled. When a favorable response was noted, subsequent injections were increased more gradually until all symptoms and signs disappeared. If the reaction to an injection was unfavorable, the patient usually complained of headache, dizziness or an accentuation of her existing symptoms. This reaction usually subsided within twelve hours. In these instances, the next dose was decreased proportionately. If the patient failed to respond favorably after three days of estrin therapy, it was discontinued and progestin therapy was given instead. If the patient showed improvement on estrin therapy but her condition was not corrected after five days of this treatment, progestin therapy was instituted and carried on in conjunction with administration of the estrogenic hormone. This treatment was continued until all nausea and vomiting ceased. In one case no further treatment was necessary. In the others, oral medication was started at this point and when necessary was supplemented with parenteral injections once or twice weekly until a sufficient estrogen reserve had been established to enable the condition to be controlled by oral medication alone. When this stage was reached, oral medication was continued for at least one week after all symptoms and signs had disappeared. The daily dose then was decreased gradually and finally stopped after three or four weeks, provided there was no recurrence. If symptoms did recur, the oral dose was increased or supplemented with hypodermic injections once or twice weekly until the fourth month of pregnancy, after which treatment was discontinued in those cases in which there were no constitutional changes still present.

In the cases in which nausea and vomiting had



been present for not more than one week no other treatment was given. If it had been present longer and the patient showed no signs of dehydration, acidosis or starvation, sedatives were given also in sufficient doses to keep the patient just short of a state of drowsiness. When the condition was more severe and evidences of constitutional changes were present, adequate supportive treatment was instituted immediately and given in addition to the endocrine medication. It was directed toward the restoration and maintenance of normal body fluids, salts, vitamins, nourishment and proper elimination.

When progestin therapy was employed in conjunction with the estrogenic hormone, it was given in 1 cc. doses hypodermically with every other or every third dose of parenteral estrin. When it was used alone, daily injections were employed until relief had been obtained or a maximum of five daily doses had been given. The reliability of this estimation is not known because as yet there has been no opportunity to subject this procedure to complete clinical tests. Progestin in tablet form was not given although it was planned to use pranone tablets (Schering) 5 mgm. each in one case and give it once or twice weekly but vomiting did not recur.

Endocrine preparations used in the treatment of these cases included liquid Emmenin (Ayerst, McKenna & Harrison) in doses of from 1 to 3 drams daily. When less than 3 drams were prescribed, the entire daily dose was placed in half a glass of water and the patient was instructed to take one third of this mixture three times daily. Amniotin capsules (Squibb) 2,000 U. each and Progynon—DH (Schering) tablets of 1.5 and 1.10 mg. each were given in sufficient numbers to correspond to the daily dose that had previously been approximated in terms of international units. Tablets of Estrogenic Hormone (Reed and Carnrick), 1,000 units each, were given three times daily in one case. Amniotin In Oil (Squibb), 2,000 international units per cubic centimeter and Progynon—B (Schering), 2,000 rat units per cubic centimeter,

were used in divided doses of various unit strength for parenteral administration. Corpus luteum preparations used were Lutein Ampules (Hynson, Westcott and Dunning), 1 cc. each and Prolution (Schering) in 1 cc. doses of ½ mg. each.

Routine vaginal smears are being made now at regular intervals in each case in an endeavor to establish the degree of estrin deficiency that is present before treatment is instituted and to observe the response of the vaginal epithelium to this type of medication. This procedure is under consideration at the present time.

These findings have been presented in this manner because the number of cases on which this method of treatment has been employed is entirely too small to warrant the establishment of any type of routine therapeutic procedure. It is an account of a clinical experiment and must be considered as such until sufficient information can be accumulated, from a study of additional cases, to justify a more careful analysis of the actual value of this particular method of treatment. Until this has been accomplished, one is not justified in drawing conclusions.

Missouri Building.

#### BIBLIOGRAPHY

1. Schneider, P. F.: *Am. J. Obst. & Gynec.* **31**:782 (May) 1936.
2. Hawkinson, L. F.: *West. J. Surg.* **30**:762, 1938.
3. Geist, S. H., and Salmon, U. J.: *New York State J. Med.* **39**:1759 (Sept. 15) 1939.
4. Rakoff, A. E.: *Am. J. Obst. & Gynec.* **38**:371 (September) 1939.
5. Smith, O. W., and Smith, George Van S.: *Am. J. Obst. & Gynec.* **33**:365 (March) 1937.
6. LeGrand, G.: *Bruxelles-med.* **19**:84 (Nov. 20) 1938.
7. Severinghaus, E. L.: *Year Book*, p. 702, 1939.
8. Goldberger, M. A.: *Am. J. Obst. & Gynec.* **33**:1093 (June) 1937.
9. Schneider, P. F.: *Med. Press.* **201**:140 (Feb. 1) 1939.
10. Sheehan, H. L.: *J. Obst. & Gynec. Brit. Emp.* **46**:685 (August) 1939.
11. Bandstrup, Ebbe: *J. Obst. & Gynec. Brit. Emp.* **46**:700 (August) 1939.
12. Naujoks, H.: *Geburtsh. u. Frauenh.* **1**:28 (January) 1939.
13. Taylor, H. C., and Scadron, E. N.: *Am. J. Obst. & Gynec.* **37**:963 (June) 1939.
14. Fluhmann, C. F.: *Am. J. Obst. & Gynec.* **33**:931 (June) 1937.
15. Wagner, B.: *Zentralbl. f. Gynak.* **63**:432, 1939.
16. Wegner, C. R.: *J. Missouri M. A.* **36**:109 (March) 1939.

## TUBERCULOSIS AND PREGNANCY

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There seems to be no doubt in the minds of reasonable medical men that tuberculosis, complicated by pregnancy, offers a graver prognosis than tuberculosis, not thus complicated. The factors which produce this clouding of the prognosis have never been satisfactorily analyzed in a scientific manner; however, it seems apparent from the time of breakdown in relation to pregnancy that it is the strain of the latter part of pregnancy and childbearing, together with the strain of caring for the child,

which contributes to the production of the breakdown. Besides mechanical and physical strain on the patient, there is a large addition to the metabolic demands occasioned by the development and the vital processes of the fetus added to those of the mother. In addition, the calcium metabolism undergoes added demands. This is shown by the tendency of the mother's teeth to decay at this time. Altogether, it is not difficult to draw a picture which makes the prognosis for the tuberculous

woman, who is pregnant, seem very dark. On this account, it is advisable always to educate the tuberculous woman concerning the dangers of child-bearing and in methods of contraception and insist on her using contraceptives at each intercourse. Prevention of pregnancy in the individual with tuberculosis is always advisable. We do not regard this point as debatable.

Besides instruction in contraception, the tuberculous patient should have instructions concerning the careful watching in case pregnancy intervenes for with good care the pregnant woman with tuberculosis has a much better outlook than if she undertakes her usual household duties and undergoes the strain of everyday work, social life or dissipation. There is no field of phthisiology in which education yields better results than in the relation of tuberculosis to pregnancy.

When conception has already occurred, the matter takes on a somewhat different aspect for then one is dealing with a life which should be regarded as having already had its beginning and is not to be interfered with lightly. In other words, the fetus must be regarded as having some rights as well as the mother. Termination of pregnancy must be regarded as termination of a life which has just begun and should never be undertaken without serious consideration. Tuberculosis does not always result fatally in the presence of pregnancy and termination of the pregnancy may sacrifice a life unnecessarily. The following case illustrates this.

#### CASE REPORT

A woman, aged 26, when first seen had tuberculosis which had reached the moderately advanced stage without cavitation and involved the apices of both lungs. Her pregnancy had reached the second month and she was willing to have it terminated if it would better her prospects of regaining her health. The pregnancy was terminated, but, despite bed rest, the tuberculosis did not become arrested promptly. Six months later, before the tuberculosis had reached a stage of arrest, the patient became pregnant again and this time was advised to carry her pregnancy to term. She did this, and at the same time accomplished arrest of her disease. She has been in excellent health for eight years and her child remains well and has a negative reaction to tuberculin (Mantoux test), at the age of 8 years.

Termination of the pregnancy may fail to save the mother's life from tuberculosis and, in that case, two lives are lost where one might have been saved. The following case is an example.

#### CASE REPORT

A woman, aged 24, had a far advanced, cavitated tuberculosis and had, at the time of consultation, a pregnancy of three months duration. The pregnancy was terminated and pneumothorax was instituted. Despite these measures, the lesion in the contralateral lung advanced steadily and resulted in her death within a year and a half.

Occasionally the clinician encounters a patient who has tuberculosis which is so hopelessly ad-

vanced that termination of the pregnancy seems useless. This is illustrated by the following case.

#### CASE REPORT

A woman, aged 39, consulted me on the advice of her family physician because of pregnancy and far advanced tuberculosis. Her pregnancy was in the sixth month and her tuberculosis involved practically all of both lungs and was of a markedly exudative character. She was manifestly extremely ill and it was felt that the termination of her pregnancy at this stage would result in her death. Hence, she was advised to carry her pregnancy to term, resting in bed constantly and endeavor to arrest the tuberculosis after labor. A normal, healthy infant was delivered but the mother died of toxemia resulting from tuberculosis within a few days after delivery. I think that termination of this pregnancy at six months would have been a sacrifice of the child's life without benefit to the mother.

The three cases are cited from an experience which is fairly large and fairly inclusive in the problems of tuberculosis and pregnancy, and the statements made are based on a prolonged study of this problem.

If pregnancy is to be terminated, it is better during the first three months of gestation when the risk, incident to abortion, is not so great as it will be if termination is made later.

Every woman who is to carry her pregnancy to term and who has tuberculosis must be carefully instructed concerning the risks to her and to her child. This instruction should include the following points: (1) The child is not to be fed at the mother's breast. (2) The mother must not kiss the child or handle it intimately. (3) All sputum must be carefully disposed of. (4) The child must sleep in a separate room. (5) The child must have a tuberculin test at least once a year. (6) It is possible for a tuberculous mother to rear a nontuberculous child if she observes the proper precautions. (7) Termination of pregnancy is not to be taken lightly for in terminating pregnancy, one is destroying human life.

In general, I am of the opinion that the rights of the fetus should be carefully considered before entering into any procedure for the termination of pregnancy, and that greater conservatism in the direction of preserving the pregnancy will result in the greater saving of lives.

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#### WARNS OF BENZEDRINE ADDICTION

A warning of the possibility of addiction to amphetamine (benzedrine) sulfate, from its continued use, is made by Sidney Friedenberg, M.D., Camden, N. J., in *The Journal of the American Medical Association* for March 16.

Dr. Friedenberg cites the case of a young woman who, given tablets of the drug for weight reduction, found that she could not carry on her duties of a beautician without the stimulus that the drug supplied. She had been taking amphetamine tablets for five months.



## PREGNANCY AND DIABETES

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Insulin has placed on the practitioner and the obstetrician an obligation that is increasing each year.

Before the use of insulin, pregnancy in a diabetic patient was rare and pregnancy at term even more rare. The outcome for the fetus, the mother or both was most discouraging. The only encouraging fact, if it can be so called, was the low incidence. In one series reported by a large hospital there were none in more than twenty-five thousand cases.

Since insulin there has been an increase in the number of pregnancies in diabetic patients and with the better understanding and use of insulin there will be more and more. Kramer<sup>1</sup> in his series had three cases in 1923 and fifty-three cases in 1934.

*Cause of Increase.*—In the pre-insulin era the young diabetic patient did not live to the child-bearing period or was infertile. Now with control there are diabetic girls who can become pregnant and others in whom fertility has been reestablished.

Skipper's figures show that of 367 married diabetic women under 46 years only 2 per cent of 190 observed prior to 1922 were pregnant while 15 per cent of 177 observed since 1922 were pregnant.

With these facts and figures in mind, it is the duty of each obstetrician to watch for diabetes and if sugar appears in the urine, which it does in a large per cent (Beckman states 80 per cent at some time during pregnancy), it imposes an immediate obligation upon the clinician to establish its significance.

From an obstetrical viewpoint, a practical classification of the combination of glycosuria with pregnancy is one suggested by Curtis.<sup>4</sup>

I. Apparently innocuous glycosuria:

1. Alimentary glycosuria (temporary but not sustained hyperglycemia).
2. Glycosuria of pregnancy (maintained hyperglycemia disappearing early in the puerperium).
3. Renal glycosuria (low renal threshold without hyperglycemia).
4. Lactosuria (present with engorged breasts, hence more correctly a puerperal concomitant of lactation.).

II. Potentially serious glycosuria:

1. Glycosuria of pregnancy showing failure of postpartum adjustment.
2. True diabetes mellitus, showing low sugar tolerance with hyperglycemia.

Repeated occurrence of sugar in the urine calls for further examination to determine if it is glucose, if there is a history of diabetes, and if there are symptoms that could be attributed to diabetes. White<sup>5</sup> has shown that the potentiality for developing diabetes is inherited as a mendelian recessive

trait. If any of these be present a blood sugar estimation should be done. If a fasting blood sugar is over 120 mgs. per cent or a postprandial blood sugar is over 170 mgs. per cent, diabetes should be suspected strongly and a sugar tolerance test should be made. If a diabetic curve is found, the patient should be considered and handled as diabetic. I think these facts should be known definitely lest a patient be falsely stamped as diabetic and the attendant hardships and mental anxiety suffered or true diabetes missed and neglected with subsequent disaster.

Next it should be learned at what blood sugar level the spill over occurs, the renal threshold, and whether the spill will keep pace with the increase in amount of sugar ingested or whether this accumulates in the blood, keeping in mind also that the renal threshold may change.

*Effects of Pregnancy on Diabetes.*—In the normal pregnant nondiabetic woman there is an increase of about 20 per cent in the metabolic rate, especially in the last trimester, a lowering of sugar tolerance and increase in blood volume. Add to this pre-existing faulty sugar metabolism of diabetes the many physiological processes of pregnancy, especially the strain on the metabolism of carbohydrates.

When carbohydrate metabolism is at fault protein and fat metabolism also will fail. The alkaline reserve drops and ketone bodies appear even in the nondiabetic patient. To control these processes and regulate to as near normal as possible is our problem. Much has been done since the use of insulin, especially for the mothers, but much more has yet to be done for the safety of the fetus.

*Maternal Mortality.*—That maternal mortality is still high even with insulin is shown by statistics. Kramer<sup>1</sup> reports 8 per cent, Joslin and White<sup>5</sup> 5 per cent, Bowen and Heilbrun<sup>6</sup> 9 per cent.

Toxemia and eclampsia are outstanding causes of death in diabetic patients, usually in the third trimester. White<sup>5</sup> states that this occurs about fifty times more frequently in diabetic than in nondiabetic patients; also, that it occurs more frequently in the younger and therefore more severe diabetic cases.

Acidosis and coma are feared during pregnancy because of low alkali reserve, glycogen depletion and increased metabolic rate. Coma during labor is even more serious. Coma was present in 9.1 per cent of the series reported by Kramer, hydramnios in 4.2 per cent, acidosis in 1.4 per cent, toxemia and eclampsia in 1.4 per cent. In Joslin's<sup>7</sup> series of 105 cases there was 4 per cent as compared with .3 per cent in nondiabetic patients.

Hypoglycemia also may cause a disastrous result, and is rather inexcusable as it usually is the result

of poor treatment, too much insulin and a low renal threshold. The percentage of deaths in well controlled cases approaches that of the nondiabetic patients. Complications such as syphilis, anemia and heart disease add to the hazard in the pregnant diabetic patient. Whether to interrupt the pregnancy or not should be carefully considered.

*Fetal Hazards.*—Because of the poor utilization of carbohydrates and the resultant glycogen depletion, which equally affects the uterine glycogen, even though the ovum is implanted in that portion of the uterus where glycogen supply is best, it is faulty to varying degrees and early abortion is likely. Skipper<sup>2</sup> reports 32 per cent in his series, Kramer<sup>1</sup> 25 per cent, Joslin<sup>5</sup> 22 per cent in the pre-insulin era and 16 per cent with insulin.

Pernicious vomiting in the early months is likely to produce an acidosis, especially in the poorly controlled cases, and while there are records of viable babies after these severe episodes, there are more cases that ended unsatisfactorily.

Hyperglycemia and ketosis, whether due to improper management or lack of cooperation by the patient, adds to the unavoidable hazards.

Malnutrition with a depletion in the plasma protein concentration may result in a patient on too strict a diet. This may be accompanied by edema, which, at times, masks the undernutrition. There is an increase in the metabolic rate and an increased demand on the mother, especially during the last two months. Approximately 50 grams additional carbohydrates are necessary for the fetus. If this is not met, first by proper proportions of carbohydrates, proteins and fats properly metabolized with sufficient insulin, both mother and fetus suffer.

Infections, whether focal as abscessed teeth or a pyelitis, add to the problem of the diabetic patient, and all foci should be prevented or eradicated if possible. Contagious or infectious diseases frequently provide the lethal dose and contacts should be scrupulously avoided. Hydramnios which occurs frequently (E. Skipper<sup>2</sup> reports 27 per cent without insulin and 11 per cent with insulin), is believed to be a factor in fetal deformities and deaths. It occurs in the poorly controlled cases and has been shown to disappear on proper treatment. Its incidence could be avoided. Babies of a diabetic mother are often abnormal. One of the most common abnormalities is the large baby and too frequently this large baby had died in utero in the last weeks of gestation. The causes and management of these cases are still debatable.

Is it because of the overnutrition of a hyperglycemic mother, exogenous insulin or hyperlipemia? Is it because of an endocrine imbalance or disturbance? That it is not altogether a nutritional cause is shown by White<sup>6</sup> and others who reported cases of large macerated babies that had died from two to four weeks before term in patients that were well controlled. That there is an endo-

crine imbalance and overactivity of the endocrine glands has been shown. An anterior pituitary like prolactin is formed by the placenta. There is a tendency for an increase of prolactin in proportion to the estrogenic substance in diabetic patients. Smith and Smith<sup>4</sup> have shown that in toxemias there is an increase in the prolactin concentration from four to six weeks preceding the attack. It has been demonstrated by Snyder<sup>9</sup> that administration of prolactin to pregnant rabbits produced intrauterine giantism, prolonged gestation, death and maceration. Early recognition of these changes and excesses may be a means of combatting this hazard, and although further work is necessary it is a possibility worth considering. If one could be forewarned four to six weeks as to the size and condition of the fetus, the type and time of delivery could be determined with less doubt and mortalities be lowered. White<sup>7</sup> reports in Joslin's series that in 60 per cent of the stillbirths the baby was overweight.

*Management of Delivery.*—That one is not dealing with a normal woman should be borne in mind. That the baby is not always healthy is a too frequent fact. Although the mother be in perfect control there are many factors that may change the balance such as a large baby, prolonged labor and the effects of anesthesia. The safety of the mother is much better protected than that of the baby. One therefore should consider the time and the mode of delivery that will insure the baby's best interests such as the diabetic state of the mother and other systemic conditions as heart disease, infectious pneumonia, kidney damage or a toxemia.

The size of the baby and period of gestation should be considered carefully. It has been suggested that roentgen ray be used in the last month of pregnancy to estimate the size of the baby and a satisfactory scale may yet be worked out. Any of these factors add to the hazard of one or both mother and child and calls for the quickest, easiest and least damaging and shocking method of delivery.

Parturition is comparable to a major operation so, whether surgical or not, the effect on the diabetic patient is to lower sugar reserves of the maternal tissues. Add to this the lowered fluid and food intake, the blood loss, the anesthesia and quantity of split proteins from the wound within the uterus, and the sudden imbalance is easily appreciated. The insulin requirement may either increase or decrease and only the strictest supervision will prevent disaster. Cesarean section is accepted quite generally and advised in the more desperate cases. Why then cannot it be used more generally for the safety and best interest of both mother and child, and at the same time if future pregnancy is not advisable and beliefs do not interfere, sterilization can be easily and quickly done.

Analgesia and anesthesia present difficult problems since prolonged use of the volatile anesthesia



is detrimental to diabetic patients. The superiority of morphine over the barbiturates is somewhat compromised by its depressing effect upon the child. Addition of scopolamine seems the ideal combination during the first stages of labor. Intimate knowledge and experience with scopolamine, however, are essential. The use of avertin is questioned because of the similarity in structure to chloroform. Ether should not be used because it stops formation of glycogen, gives rise to hyperglycemia, temporarily diminishes the excretion of urine, nitrogen, glucose and acetone bodies. The nausea often following its use interferes with the intake of fluids and foods. Nitrous oxide or ethylene with oxygen is doubtless the first choice, especially of the volatile anesthetics or in combinations with infiltration. Spinal anesthesia is thought by many to be the one of choice.

*Care of Newborn Infant.*—The baby born of a diabetic mother is not a normal baby, at least temporarily. It has lived, grown and developed in a state of hyperglycemia and hyperinsulinism. Whether the hyperinsulinism is due to the exogenous insulin of the mother or an essential hyperinsulinism as reported by Gray and Feemster<sup>10</sup> is still debatable. That there is a proportionate increase in the number as well as the size of the islands of Langerhans is recognized. Disregarding the cause or the physiological mechanism, the fact remains that these infants have a low blood sugar and that the administration of glucose, either orally or parentally, is necessary. Smith and Olney<sup>11</sup> routinely use 3 per cent glucose in Ringer's solution as soon as the infant reaches the nursery. There is usually a return to a normal insulin production in about three days but it may be from four to six weeks. Blood sugar tests should be made if necessary.

*Lactation.*—Lactation in diabetic patients seems to depend upon several factors. Probably the most important are the severity and duration of the dis-

ease, the nutritional state, control of the diabetes and the onset of diabetes. It is more apt to be normal when diabetes begins during pregnancy. Lactation is usually scanty or absent in the diabetic mother.

*Treatment.*—The principle of treatment of diabetes in pregnancy is the same as diabetes in the nonpregnant patient. There are, however, so many factors involved that its management is often difficult and complicated. Each case is an individual problem.

#### SUMMARY

Pregnancy in diabetic patients is increasing. Diabetes should be watched for more diligently now in the insulin era. The appearance of glucose in the urine calls for complete investigation. Diabetes complicates pregnancy and other complications are more likely if the two are present. In a well controlled diabetic patient the pregnancy and course nears that of the nondiabetic patient. Pregnancy with diabetes demands the care of one thoroughly acquainted with the treatment of diabetes and one that can recognize the complications and carry out the proper procedures. Cesarean section using spinal anesthesia, as soon as the baby is viable, is probably the safest and most feasible to both baby and mother.

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#### BIBLIOGRAPHY

1. Kramer, D. W.: *Am. J. Obst. & Gynec.* **30**:68 (July) 1935.
2. Skipper: *Quart. J. Obst. & Gynec.* **30**:1935.
3. Beckman, H. F.: *J. Indiana M. A.* **29**:23 (January) 1936.
4. Curtis, A. H.: *Obstetrics and Gynecology*, Saunders and Company, **1**:957, 1933.
5. White, D.: *Am. J. Obst. & Gynec.* **33**:380 (March) 1937.
6. Bowen, B. D., and Heilbrun, N.: *Am. J. M. Sc.* **183**:803 (June) 1932.
7. Joslin, Elliott P.: *The Treatment of Diabetes Mellitus*, Philadelphia, Lea and Febiger, 1935.
8. Smith, O. W., and Smith, G. V.: *Am. J. Obst. & Gynec.* **33**:365 (March) 1937.
9. Snyder, F. F.: *Bull. Johns Hopkins Hosp.* **54**:1, 1934.
10. Gray, and Feemster: *Arch. Path.* **1**:348, 1926.
11. Smith, F. S., and Olney, M. B.: *J. Pediat.* **13**:772 (November) 1938.

## HIDDEN LIABILITIES IN MATERNAL WELFARE

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Mankind is too likely to judge maternal welfare in terms of obstetrical deaths. To all death is a horrible catastrophe and an acknowledgment of medical failure, but not necessarily an acknowledgment of medical fault. The people view death as a doctor's mismanagement. This is a subtle compliment to the ability of the medical profession with the reasoning that the proper doctor will always be able to prevent death. The doctor, however, views death as a natural terminal condition, wherein pathological condition overcomes the human machine beyond all possibility of repair.

The critic sits in his distant office, calmly adds the fatality figures and coldly points the finger of scorn at the highest record. Here is the district to be rejuvenated, lectures given, medical men educated, lay women impressed and the community adjusted and labeled as medically unfit. Here is the place to center our efforts to increase medical knowledge, to curb careless medicine and force better care and closer supervision of prospective mothers. By the yardstick of death, we judge our neighbors. By this standard, the doctor judges his fellow doctors. He even goes so far as to de-

mand a medical court to review all deaths and fix the responsibility upon the proper doctor.

Other communities where the death rate is remarkably low are pointed to with pride. To them are thrown bouquets and national notice is given. Their doctors are elevated to the position of superior beings for have they not produced the lowest death rate record which is the major standard by which we judge?

I really do not mean to delegate this important standard to the rear seat, but I intend to point out that such a condition is but one of many necessary standards in the study of this particular subject. There are many underlying conditions barely recognized and often thoroughly neglected by those whose major interest is maternal welfare.

Maternal welfare is an attempt to approach perfection in the production of live healthy babies and in turn keep live healthy mothers. From the cradle to the grave, woman is the subject and the object upon which we center our efforts. The male also enters the picture from birth until death. Their civilization, physical health, emotional strains, heredity, habits and medical environment all enter the study and should not be forgotten.

The baby is important not only to the family but to the community. Every time a baby is born, regardless of its social status, it creates an extra demand for goods. This new demand creates more work for somebody. The community has benefited. The nation whose birth rate far exceeds its death rate is young, progressive and growing in true wealth. As the birth rate falls, so does national virility fail and old age sets in with possible national extinction in the future. The birth of a live healthy baby is an economic factor whose influence extends far beyond the single family fireside.

It is my purpose to consider some of the important hidden liabilities in maternal welfare which too often are neglected in a discussion of this subject. These are undercover damages, even causing death, which rarely come to the surface as events or conditions due to childbearing.

Gonorrhea as viewed by the male is merely an unpleasant physical experience of a few weeks duration. To the female it is a major physical catastrophe. The loose environment of city and rural communities wherein the boy of from 15 to 19 years can easily enjoy the clandestine society of contaminated women is the early step to later shame, wife infection and child blindness with damages ending in sterility, invalidism and even death. The environment of prostitution, whether it be in the brothel or with the sporadic adventuress, is a blot upon clean living and a great obstacle to clean obstetrics. The male is the great offender; also he has been the great lawmaker and judge of conditions. Until women, by the inherent right of equal suffrage, change this picture, this evil will remain a hidden liability too lightly considered and barely mentioned as of major significance in mater-

nal welfare; yet the gonococcus lurks close to the high school and college, hushed by man made laws which are unenforced. As it is passed to the female organism it frequently leaves permanent infection within a new mother which may be a big factor in her death. In such an event we scorn the unfortunate attending doctor and disregard the underlying factor.

Syphilis is a catastrophe to the male as well as the female. Our clinics have 4 per cent contamination while our private practice has from 1 to 2 per cent. The loss of conjugal confidence, the miscarriage loss, the permanent physical damage, the heartaches and the role of those born unfit, play a major part.

The environment of our boys and girls reflects the thoughts of our men and women. As the child is raised, so he probably will be. There is little difference in end result between the rich man's child raised by the maid and the poor man's child raised in the street. Regardless of the old argument, the value of heredity, a clean apple will not stay clean in a barrel of rotten apples. Where environment is poor, thoughts are impure and these weeds sowed in childhood help make the laws in adulthood. Dishonest acts of father and mother as well as unclean clubs and corner loafing, leave unclean weeds planted in young fertile soil. The distorted youth becomes an adult. He pays and what is more important to us, the woman pays twofold and the community pays threefold. Poor environment, which does not necessarily mean poverty, pays dividends in venereal disease, quick marriages with their quick regrets and divorces with lasting effect on children and parents. In the palace or the hovel it leaves its everlasting imprint, its obstetrical toll and its community loss.

Abortion is a major item. I believe with Dr. F. J. Taussig that 700,000 occur per year. They leave their toll with a certain per cent dead, a large per cent permanently damaged and a distinct maternal welfare problem carefully avoided by the doctor, or, often aided by him. This is a great maternal and fetal loss to the community.

Some women have bodies which do not stand the strain of pregnancy without leaving dangerous results. I refer to the toxemias of pregnancy which leave 50 per cent of women with permanent hypertension and this condition is furthermore aggravated by future pregnancies. Their condition is such that few insurance companies will accept them, without increased premiums. This is indeed a serious hidden liability of obstetrics wherein the medical deficiency does not become apparent for several years. The death of many women from hypertension, apoplexy, chronic nephritis and other kidney complaints, possibly had its origin in a past pregnancy state. I venture that a 10 to 20 per cent ratio is a fair estimate concerning these cases.

It is well known that the pregnant state dilates



the female ureter which subjects all pregnant women to the possibility of infected kidneys. It is common knowledge that these dilated ureters often remain for many years after childbirth. A certain amount of pyelonephritis, operations and deaths are directly due and instigated by former pregnancies.

Obesity is a problem. Quite often it is a direct result of maternity. Often it carries the penalty of refusal of insurance. It is a hidden liability of obstetrics.

As I mentioned before, one is too prone to judge maternal welfare in terms of deaths. There are two kinds of death. In one kind the patient is buried. Fortunately, this class amounts only to from 3 to 8 per 1,000 live births which is not a startling figure. The other kind of death is a living death. The patient continues to live, full of aches and pains, partially or totally incapacitated, an unfit mother for proper child training and an unfit wife, full of querulous complaints. Some seek and get relief through surgical procedures while others do not get the expected relief; still others go into old age with old age's other medical problems, with troubles enough that they wish they were dead.

Among these living deaths which are numerous in every neighborhood is a class relieved by surgery. In a certain general hospital, 1,400 operations were performed during the year. Roughly, 400 were nose and throat operations and 400 were gynecological operations. Of the latter 400, 320 involve gynecological repairs resulting from childbearing episodes. The known obstetrical damage amounted to one fourth of the entire year's surgical history. The cystoceles, rectoceles, prolapses, retroversions and pelvic inflammations are hidden liabilities which should not be passed over lightly. The community with ten deaths per thousand live births is not necessarily a community for scorn without an intensive study of its hidden morbidity. Operative liabilities do not show directly in maternal death rate columns. They must be sought in a close study of all deaths, all sickness and all operations. Maternal welfare in terms of death is not as interesting nor as instructive as the huge hidden liabilities which present a vast unexplored field with a high sabotage.

It is my belief that childbearing is a more dangerous event than it is generally believed to be. The direct damage as shown in the immediate death column is of minor caliber when we compare it with future deaths, operations, invalidism, expense, bankruptcy of finances and family ties and sterility. I venture that such a study would place childbearing as indirectly one of the largest causes of death among our women.

There are certain modern procedures in obstetrics which are popular yet open to reasonable criticism as being methods which increase hidden liabilities. Some of these procedures I enumerate as follows:

(1) The attempt to shorten the length of labor.  
(2) The prevailing influence which teaches that operative interference of any nature during a normal labor will produce as good ultimate results as if nature followed her own laws.

(3) The great preference given to good perineal repairs as of more importance than the careful attempt to avoid the permanent pelvic damages which the repair so successfully hides.

(4) The wholesale use of deep narcosis during early labor without any great amount of reasoning as to how much and which type to use. The modern tendency is to use one favorite drug with one favorite dose at stated intervals upon all individuals.

(5) Specialists today are picked indirectly by written examination and a few hours of personal contact with young men, with great importance placed on where and how long their internships were, with still greater importance upon absolute restriction to this one branch of medicine. This limiting of their horizon prevents the proper broad experience of medicine as a whole. Such a man should not, in all fairness, handle a case by himself. Other specialists picked the same way should be used to make up for his lack of general experience. What such a specialist demands in his specialty he must concede to every other like specialty. He is on trial today.

(6) The general acceptance that just pay for the usual labor should be a few \$10 bills too often repays the debtor as he has paid. One cannot expect to purchase a fur coat at a cloth coat price. The value of obstetrics is only partially shown in the delivery of a live baby and leaving a live mother. The real art lies in producing a healthy baby and in turn leaving a healthy mother.

(7) The published results of experienced men of exceeding skill are read by men of ordinary experience who try to reproduce the highly skilled procedures and fail miserably.

(8) The ready acceptance of any new procedure before it has been thoroughly tried and tested.

As surely as one cannot judge a great business organization by its visible yearly report, just as surely one cannot judge a community by its maternal death rate. Deep down, hidden from sight, are hidden liabilities. If they be few the organization is strong. If they be many the institution needs adjustment. Do not overstress the yearly reports. Study the hidden liabilities.

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#### NO DANGER OF INHALING SHAVED HAIR

There is no danger of inhaling hair from dry shaving, as the diameter of human hair is too great to permit successful inhalation, *The Journal of the American Medical Association* for March 16 declares in answer to an inquiry.

## OBSTETRICAL PROGRESS—ABRUPTIO PLACENTAE

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## HISTORICAL

Premature separation of the placenta was reported as far back as the Hippocratic era; however, the accounts are scattered and incomplete. It was not until 1609 that Louise Bourgeoise described the pathological factors which produced it. Previous to 1664 it was thought that all hemorrhage of pregnancy was due to a premature separation of a normally implanted placenta, that is, a placenta located in the fundus of the uterus. In 1685 Paul Portal of Paris showed for the first time that the attachment might be low near the internal os and that hemorrhage was the inevitable accompaniment of this abnormal implantation. Rigby<sup>1</sup> in 1776 differentiated clearly between the bleeding condition of low implantation (placenta previa) and the premature separation of the placenta (abruptio placenta). The next noteworthy work on premature separation appeared in 1870 when Goodell<sup>2</sup> presented a monograph on "Concealed Accidental Hemorrhage of the Gravid Uterus." He collected literature on 106 cases and emphasized the ineffectiveness of the treatments being used. Following the publication of Goodell's monograph there was an increased recognition of this complication of pregnancy and the factors involved in it. Holmes, in 1901, contributed a work on the subject in which he reported upon 200 cases. His conclusion was that his work did not give a true picture of the incidence of the accident. It is only in more recent years that the etiologic, pathologic and symptomatic characters have been recognized and recorded.

## TERMINOLOGY

Premature separation of the placenta is the most descriptive of all terms used to describe this condition and falls short as an ideal term only because of its length. Accidental hemorrhage, a term Rigby is credited with originating in 1775, is frequently used by English writers, but it is misleading as it suggests a trauma which is not always present. In 1901, R. W. Holmes<sup>3</sup> of Chicago suggested "ablatio placenta." This, however, ignored the fact that the process may be only partial from the beginning to the last and nearly always is partial at the time of diagnosis. DeLee<sup>4</sup> suggested the term "abruptio placenta." Abruptio implies a sudden separation, violent in nature, which seldom occurs even in a traumatic condition. This term is used quite generally in various parts of the country. Schumann<sup>5</sup> concisely summarized the condition as follows: "Premature separation of the normally implanted placenta implies that partial or complete detachment of the organ from the uterine wall has occurred prior to the third stage of labor, that is,

during pregnancy at the onset of labor or during its progress."

## INCIDENCE

Different investigators naturally show a wide variation as to the frequency of premature separation of the placenta. This is particularly noticeable among the earlier writers. Scott<sup>6</sup> reports one investigator who found that premature separation of the placenta occurred more frequently than low implantation in the ratio of 17:14. Other early reports vary from 1:150 to about 1:600. Holmes<sup>7</sup> found it to occur in the ratio of 1:200 pathologically and about 1:500 clinically. DeLee<sup>4</sup> found complete separation to occur in less than one in 500 cases. Davis and McGee<sup>8</sup> reported fifty-two cases of complete separation in 40,000 deliveries at the Chicago Lying-In Hospital, a ratio of about 1:800. An additional 112 cases were found among the partial separation cases giving roughly a ratio of 1:250. Schumann<sup>5</sup> gives figures which check well with these reports. He found a ratio of 1:200 in mild cases, particularly if there was a low implantation of the placenta. In severe cases the ratio went up to 1:800. In reviewing the literature from 1932 to 1936, Bland and Rakoff<sup>9</sup> found an incidence of 1 in 100 or to be more exact, 0.93 per cent. Goodell<sup>10</sup> recently showed 600 of 750 placentae from consecutive deliveries had some evidences of hemorrhagic lesions, but only in eleven instances had there been a history of vaginal bleeding. The term "concealed hemorrhage" has useful significance in emphasizing this point. Davis<sup>11</sup> stated that 18 per cent or about one in twenty shows completely concealed hemorrhage. Wide variation in figures is due to inclusion or exclusion of mild cases, many of which are not seen in the hospital and therefore are not readily available for statistical studies. After correction is made for the preponderance of multiparous labors the condition is still more common among multiparae. There seems to be a prevailing opinion that if it does not occur with the first pregnancy it is not likely to occur until several pregnancies have intervened.

## ETIOLOGY

In a vast majority of the cases the cause of premature separation of the placenta is a perplexing problem. Except in a few scattered instances no single factor can be designated as the sole cause. Furthermore, investigation is difficult because human experimentation is impossible and in the lower species the placenta varies considerably from the human. Early writers were prone to explain most cases on a traumatic basis. Holmes stated that sixty-seven of two hundred cases were due to,



trauma. Later writers found many less cases and now relatively few consider it a factor of importance. Seldom is a pregnant woman seen that has not had a history of a fall or other actual physical violence to which a condition of premature separation of the placenta might be attributed. Jars, turning in bed, coitus, blows or kicks in the abdomen, purges, and coughing are some of the various types of trauma suggested as causes. A few cases have been reported following attempts at external version. Another suggestion as to cause offered by early writers was that of profound mental emotion. Shortness of the umbilical cord is a definite though rare cause as demonstrated in that classical specimen of Pinard and Varnier reported in 1892. It was definitely shown that a short cord gave undue traction on the placenta. Gardiner<sup>12</sup> stressed this as being an important factor but fortunately this abnormality is rare. A cord may be relatively shortened by being wrapped several times around the baby's body and thus cause tugging on the cord at the time of birth. Occasionally sudden reduction in the size of the uterus as occurs when the membranes rupture in hydramnios, or after the delivery of the first child in multiple pregnancies, must be considered as a factor in cases recognized as premature separation. Balasquide<sup>13</sup> reports a case of multiple pregnancy in which premature separation discovered at cesarean section was a complicating factor. Multiparity is a predisposing factor. Baird<sup>14</sup> in 1936 gave a series of fifty-six fatal cases. Of these patients, 30 per cent had had seven or more children. There can be little doubt but that in many cases of premature separation some toxic condition plays a part, be it the acute toxemia of pregnancy or a stage of chronic nephritis. Conditions causing these might be readily understood as being similar. In 1885 Winter<sup>15</sup> demonstrated the frequency of albuminuria in the condition. This subsequently led to the idea that chronic nephritis was the most common cause. Hofmeier<sup>16</sup> reported fifty-eight cases in which thirty-three had nephritis. Fehling<sup>17</sup> pointed out the coincidence of placental infarcts and hemorrhage in chronic nephritis. Thus it followed that hemorrhage in the decidua satisfactorily explained the premature separation. Pathological bleeding is undoubtedly an etiological factor of importance in premature separation of the placenta. In 1901 DeLee called attention to the hemophilic nature of some cases. Haden<sup>18</sup> states that the two most significant factors in a hemorrhagic state are (a) a disturbance in the clotting mechanism and (b) increased permeability of the capillary walls. Vitamin K deficiency with possibly a lowered prothrombin level may be a contributing factor in the former and thus be of significance as a cause of premature separation of the placenta. Hofbauer<sup>19</sup> suggested that an excess of histamine in the tissue of the placenta is the causative factor.

Browne<sup>20</sup> proved that bacteria could cause tox-

emia in animals with injured kidneys and thereby produce placental separation. Oxalate of uranium was used to cause the nephritis. He then superimposed a bacillus pyocyaneus. Datnow<sup>21</sup> produced hemorrhagic lesions in the placenta of rabbits with selenium and cadmium salts. Similar conditions have been produced experimentally by animal injections of uranium nitrate. Bartholomew<sup>22</sup> contends that hypercholesteremia is probably the fundamental basis for the toxemias of pregnancy. Excessive storage in the placental arteries with resulting vascular changes is the predisposing cause of infarction in the placenta. Thrombosis or rupture of a placental artery, occurring either spontaneously or possibly by trauma of fetal movements, is the exciting cause of the acute infarction of the placenta. Placental infarction results in the liberation of peptone, guanidine and histamine as split toxic products of placental protein. "The amount and location of the infarction, the degree of vessel obstruction and rapidity of autolysis determines whether pre-eclampsia, or eclampsia, or premature separation of the placenta will occur."<sup>22</sup>

Although estimates have been made that the condition occurs four times as frequently in patients suffering with toxemia, there is still some contradicting evidence. For example, in many cases the urinary findings are negative, the blood pressure is not elevated before or after the accident and at autopsy characteristic local lesions cannot be demonstrated. Perhaps the toxic conditions are so mild as to be unrecognized by present methods. Deickmann<sup>23</sup> in a study of fifty-eight cases showed that premature separation of the placenta is associated with a vascular disease which only rarely is due to chronic glomerulonephritis. The pregnancy may stimulate a latent hypertension as well as aggravate one already present. In 1918 Morse<sup>24</sup> produced the condition called uterine apoplexy by ligating certain uterine vessels and producing tension on one horn. Couvelaire and Couvelaire<sup>25</sup> recently reported additional work on the condition also known as uteroplacental apoplexy. They concluded that the actual cause of the condition was vascular rupture from hypertension which is associated with albuminuria. The rupture begins in the capillaries. Cases with anuria or oliguria are reported which at autopsy show necrosis of the cortex of the kidneys. Scriver and Oertel<sup>26</sup> believe this due to vasoparalysis and stasis and thrombosis. Ash<sup>27</sup> thought it was due to angioneurotic edema. Syphilis is likely a factor although its importance is disputed by many investigators. Diabetes may be a factor because of the high incidence of toxemias among diabetic patients. Dietary deficiencies likewise may be considered a factor as many cases of toxemias of pregnancy show deficiencies.

The endocrines are suspected of playing an important part. Kelly,<sup>28</sup> Teel<sup>29</sup> and others produced hemorrhagic lesions in the placenta in normal

pregnant animals with estrin and anterior pituitary preparations. Heim<sup>30</sup> reports high urinary prolactin in premature separation cases. Taylor and Scadron<sup>31</sup> recently have done work on hormonal factors in the toxemias of pregnancy. They state that "in a broad sense there can be little doubt that placental hormones are a factor in the late toxemias of pregnancy." They further conclude that "hormone changes observed in the toxemic patients are perhaps associated with the cause of the toxemias, but may simply be the result of the disturbance of kidney, liver or placental physiology." This approaches the present status regarding the endocrines with reference to premature separation of the placenta.

Maxwell<sup>32</sup> and Evans<sup>33</sup> have shown that vitamins B, C and D deficiencies will produce hemorrhagic lesions in the placenta with separation from the uterine wall. Hormones and vitamins are often closely associated. Schute<sup>34, 35</sup> showed this with regard to vitamin E and estrogenic substances in which he definitely found an imbalance between the two. His clue to treatment lay in that he found an excess of estrogenic substances in those cases where there was bodily deficiency of vitamin E. He reports that massive doses of vitamin E completely abolished, in twenty hours, the circumscribed area of uterine tenderness seen in many cases. Likewise the backache and uterine cramps subsided as rapidly. Bleeding, when present, stopped promptly. As evidence of merit in his treatment, he was able to show that the withdrawal of the medication gave a return of the tenderness, bleeding and other symptoms. Siddall<sup>36</sup> suggested that vitamin B<sub>1</sub> deficiency is an important factor in the eclamptic and pre-eclamptic patient. He concluded that normal function of the pituitary is possible only if sufficient B<sub>1</sub> is present. If there was a deficiency he found an overcompensation or malignant hyperfunction of the pituitary with its resulting disturbed carbohydrate metabolism, edema, elevated blood pressure, nausea and vomiting. Also an increase in prolactin and a decrease of estrin in the blood were noted.

#### PATHOLOGY

Except in those rare instances in which the fetus has been dead for some time, there is always hemorrhage concealed or otherwise following separation of the placenta. With a dead fetus it is possible for thrombosis to occur in the uterine sinuses early and thus prevent gross bleeding, even without the usual mechanism of a contracted uterus controlling the hemorrhage. When the uterine sinuses are held wide open before the occurrence of thrombosis, the full force of the arterial pressure causes hemorrhage into the uterine cavity. Adjacent organs occasionally show a similar hemorrhagic tendency.

At the onset of separation, a hematoma is formed on the maternal surface of the placenta which may remain so small as to give no symptoms. It may be

discovered only accidentally after expulsion of the placenta. If the process is not discovered and is allowed to progress, eventually a large area is separated so that a portion of the placenta will no longer function. The retroplacental hematoma acts as a foreign body and stimulates uterine contractions. Overstretching of the uterine musculature with interstitial hematomata causes intense pain. Inasmuch as all stages of the process and all degrees of severity are encountered it is difficult to classify the various types. Falls<sup>37</sup> divides the processes into the following groupings:

1. Complete Separation in Early Pregnancy: The placenta peels clean from the uterine wall and is then expelled together with the retroplacental clots. No changes may be detected in the uterine wall whatsoever. No doubt many abortions are the result of this mechanism.

2. Incomplete Separation With Apparent Hemorrhage: This occurs during the third trimester. At expulsion of the placenta the only evidence of the condition will be a partly organized old blood clot with slight degenerative changes in the overlying portion of the placenta and in the corresponding underlying uterine wall.

3. Complete Separation With Apparent Hemorrhage: In this group there is initially concealed hemorrhage. The blood dissects the membranes away from the uterine wall down to the cervical os and then flows into the vagina. Little damage is done to the uterine wall but there may be severe anemia if the blood loss is excessive.

4. Complete Separation With Concealed Hemorrhage: With the placental margin intact the hemorrhage may bulge the uterine wall outward and that of the placenta inward. There may be complete separation of the placenta with retention of blood maintained by an intact membrane attachment. In other instances the blood may force its way into the amniotic cavity by rupturing through the membranes. This is a rather rare condition. Hemorrhage may also remain concealed by a firmly placed head at the internal os. A firm mucous plug temporarily may prevent the escape of blood. It is stated that back pressure in the uterine cavity causes infiltration of the uterine muscles although some consideration must be given to factors of friability and fragility of tissue. There may be multiple hemorrhagic extravasations but they are most pronounced near the placental site. These small intramural hemorrhages surround smaller vessels. The neighboring tissue is edematous and the result is separation of the muscle fibers. This condition is one commonly termed utero-placental-apoplexy. It explains the frequency of postpartum hemorrhage due to the inability of the musculature to contract properly following the emptying of the uterus; the muscle fibers have lost their power of contractility. Externally, the uterus, tubes, ligaments and occasionally the ovaries may take on a purplish red coloration, and in places may show small fissures.



Its appearance has been compared to that of an ovarian cyst with a twisted pedicle. Couvelaire in 1912 is credited with adding valuable observations to our knowledge concerning this serious condition which is found in the most grave cases of premature separation of the placenta. There is frequently considerable blood in the abdominal cavity as well as large amounts of old clots in the uterine cavity. Blood may reach the peritoneal cavity by direct passage through the muscle fissures or through the lumen of the tubes. There is usually an acute secondary anemia.

5. Complete Separation With Concealed Hemorrhage Followed by Apparent Hemorrhage: In rare cases the pathological condition as described in group 4 may have superimposed a secondary expulsion of blood clot before or after the fetus is born. The uterus instead of contracting down around the fetus may remain as a flabby inert muscular sac. Fatal hemorrhage may result in these cases unless the uterus is removed. The uterus is in a state of utero-placental-apoplexy and cannot function properly.

#### SIGNS AND SYMPTOMS

Typical premature separation of the placenta presents severe, constant, acute pain over the uterus. Later this is usually followed with hemorrhage, the amount depending upon the type of separation and the extent of the process. This is in marked contrast to the painless bleeding of low implantation. It is not to be implied that all cases of the former are so typical. Some cases are quite insidious in both their onset and development. A frequent and significant sign in the early stages of premature separation is the gradual appearance of a restricted palm sized area of true uterine tenderness accompanied by steady sacral backache. Reflex nausea and vomiting may be early symptoms and mislead the physician into the belief that the cause of the upset is gastrointestinal in origin. This may be followed by labor pain, violent fetal movements and uterine hemorrhage of varying degrees of severity. In the well defined and advanced case the uterus will be boardlike in consistency without alternations of relaxation and contraction. The outline of the child can not be made out because of this spastic condition. The fetal heart tones may show only slight embarrassment in the early stages. With progressive separation the heart beat suddenly may become rapid and weak or may disappear entirely.

Richardson<sup>38</sup> emphasized the significance of fetal heart tones in placental separation. The oxygen carbon dioxide balance of the fetus is disturbed by the separation with an acceleration of the fetal heart rate. It is his contention that the rate bears a definite relationship to the amount of placental separation and that there is an alternating compensatory and asphyxia phase. He believes this an invaluable sign in diagnosis, prognosis and treat-

ment. Richardson's opinion is not universally accepted.

Shock, a further symptom of premature separation, often appears soon after the onset and may be out of all proportion to the amount of blood loss. Typically the patient becomes pale, cold and clammy with a rapid steady pulse and a marked drop in blood pressure. Faintness, thirst, dizziness and spots before the eyes are complained of and air hunger may be evident. The signs of shock may appear late and frequently such signs cannot be relied upon for early diagnosis. If hemorrhage is of the external type there is in comparison less severity of the outstanding features; namely, the pain is less, the consistency of the uterus may not be changed and there is no enlargement. This type may simulate closely a low implantation. With concealed or partly concealed hemorrhage, repeated abdominal examinations show the uterus to be increasing in size in one or more dimensions with growing rapidity. A tender bulging placental site at the point of separation occasionally is noticed in the abdominal contour. Vaginal examination is of value in differentiating from placenta previa. Such examination should be done gently lest it result in increased hemorrhage due to disturbance of the ball-valve action of the presenting part. This interference allows the escape of blood that previously was held in utero.

In case of complete separation with concealed hemorrhage, followed later by apparent hemorrhage, the uterine consistency may change. The early tetanic state may change to one of flaccidity. The fetal outline may become more apparent than usual. The diagnosis of rupture of the uterus with the fetus free in the abdominal cavity may be made. Frequently there is severe shock. Postpartum hemorrhage is feared more than usually because of the relaxed condition of the uterus. Hemorrhage into the abdominal cavity is frequent, due to tears in the visceral peritoneum and overdistention of the uterus. DeNormandie<sup>39</sup> found in all of his thirty cases two signs of impending trouble; namely, bleeding and absence of normal uterine contractions. He states that the earlier one notes the change in resiliency of the uterus the better will be the prognosis, providing delivery is effected immediately.

Laboratory work may be misleading as to the gravity of the situation. Repeated counts may be of value if the patient's condition will permit such delay. Hemoglobin, hematocrit and serum protein will be lowered in proportion to the hemorrhage. Again, this may be observed too late to be of value in successful management of the case. If the condition is associated with a toxemia of pregnancy the laboratory findings will remain primarily those of toxemia.

#### DIAGNOSIS

A patient in the third trimester complaining of sudden, sharp abdominal pain, and presenting a

boardlike rigidity of the abdomen is typical. Usually in an advanced case the diagnosis is made easily. If on examination no placenta can be felt near the cervix the condition of placenta previa is fairly well excluded. With signs of oncoming shock and apparent hemorrhage less than would be suspected, the diagnosis is further confirmed. As previously stated, a most valuable sign in the early diagnosis is the sudden onset of sacral backache associated with a localized area of tenderness over the lower abdomen which probably corresponds to the involved area in the uterus. Signs of toxemia, if present, are of great value.

The condition may easily be confused with spontaneous rupture of the uterus as pointed out in the development of symptoms. The essential points of differentiation are: (a) There is no uterine contraction following spontaneous rupture. (b) The uterus may be small and to one side. (c) The child then will be felt as a separate tumor. (d) The rent may be felt in the uterus. (e) There will be no presenting part upon rectal or vaginal examination. The differentiation is more difficult if in spontaneous rupture the child is retained within the uterine cavity. It also must be borne in mind that a ruptured uterus may be preceded by a premature separation. Typically, painless bleeding without apparent cause in the third trimester is recognized as low implantation; but if the placenta is not attached sufficiently low as to be within reach of the examining finger it can well be confused with premature separation. Herein lies a small group of cases that are difficult to classify antepartum even when all the available facts are known. Furthermore, it is not inconceivable to actually find placenta previa in a case of toxemia, and still there may be present faulty implantation only.

Other conditions for consideration in the differential diagnosis are simple premature labors in the presence of bleeding polyps, uterine fibroids, "habitual child death in utero" and purpura hemorrhagica.

#### PROGNOSIS

Statistics on maternal and fetal mortality, as quoted, vary considerably. The number of mild cases that are included or excluded in tabulations, by necessity, cannot be uniform. In severe cases the fetal mortality ranges from 95 per cent to 100 per cent while maternal mortality approaches 50 per cent. Falls<sup>37</sup> states that the maternal mortality ranges from 5.7 per cent to 50 per cent while fetal mortality ranges from 50 per cent to 85 per cent. Bland and Rakoff<sup>9</sup> report a maternal death rate of more than 6 per cent and a fetal mortality from 45 per cent to 100 per cent with an average of about 70 per cent. Davis<sup>6</sup> gives 7.3 per cent for maternal mortality with 60 per cent for fetal mortality. From even the most optimistic figures it can be seen readily that the prognosis is discouraging unless the condition is recognized promptly and the proper course of procedure initiated early.

#### TREATMENT

Certainly no complication of pregnancy calls for keener judgment and more careful management than does the care of the premature separation of the placenta. Since there is a wide range of severity there likewise exists a marked variation in the methods of treatment. Each case must be individualized. Treatment cannot be specific with such a wide variation of unknown etiological factors. Between the policy of masterful and watchful waiting to the limits of most prompt radical surgery and mutilating procedures, the attending physician must choose his course. Without question this is a problem for the consulting specialist. Too often the general physician and inexperienced practitioner fail to recognize the gravity of the situation and the case is beyond recovery before it has reached competent hands.

*Prophylactic Treatment.*—Since many cases are associated with the toxemias it is agreed fairly well that prophylactically the treatment is the prevention of the so-called toxemias of pregnancy. Doubtless many of the threatening or mild cases correct themselves spontaneously or at least do so with only little encouragement from the doctor. Nature's reserve has been sufficient.

*Active Treatment.*—In general it may be stated that the amount of hemorrhage determines the extent of active treatment but, when not apparent, the patient's systemic reaction to concealed bleeding is the lone source of estimation. Other factors modify the course to be followed, namely: (a) condition of the cervix, (b) size of the pelvis, (c) size and position of the fetus, (d) contractility of the uterus, and (e) parity. A small degree of separation with small blood loss may require little treatment besides bed rest. Sedation is advisable to allay the patient's anxiety. Varying amounts of corpus luteum hormone are given with apparently good results in the hands of a few. If the pain and distress increase without evidence of impending shock, further treatment for quieting the uterus should be resorted to. Opiates and barbiturates are indicated. At this point it is recommended by many that if the patient is a primipara and especially if elderly, with a live baby and with more bleeding than spotting, or if the baby shows signs of distress, cesarean section should be done at once. Major surgery always cannot be advocated, but its possibility always should be considered. The mildest case with the minimum of apprehension by both patient and doctor may suddenly within an hour's time become a most distressing condition. Consequently, the possibility of an emergency should be borne in mind even in less severe cases and preparations made for any situation that may arise.

Irving<sup>40</sup> recently gave strong evidences against the value of routine cesarean section. He maintained, and his statistics bear him out, that a large majority of his cases were handled by conservative treatment equally as successfully as by radical.



From 1916 to 1937, 353 cases were admitted to the Boston Lying In Hospital, 234 of which had external hemorrhage and 119 had internal hemorrhage. He definitely states that "conservative measures gave a better prognosis for the mother in both types of premature separation of the placenta." Many authorities sharply disagree with these conclusions. Border line cases of from twenty-eight to thirty weeks gestation with moderate hemorrhage that seems to be under control often are carried along with the idea that radical intervention might be necessary at any sign of increasing distress. A patient in labor with a dilated or dilatable cervix should be treated to shorten the time in which the uterus may be emptied with forceps or with version if necessary. Version and breech extractions are often dangerous because they add to an already serious condition of shock or at least its predisposition. Following early section the prognosis is most hopeful; thus, if an operative procedure is decided upon an early decision obviously should be made. When a state of shock is present numerous transfusions may be indicated. When general supportive measures have rendered the patient operable, immediate surgery should be done, possibly to be followed again with more transfusions. When sufficient blood cannot be secured, glucose, saline or gum acacia may be used. Some favor the 5 per cent acacia over glucose in combating shock as it is retained longer within the circulatory system. In either event, distilled water is preferred to saline because of the frequent association of nephritic or hepatic dysfunction. The value of transfusions can well be appreciated when it is kept in mind that the cause of most fatalities is due to hemorrhage with shock. Every bleeding case calls for typing and the securing of a supply of donors. Two thoughts must be in mind; namely, (a) control of hemorrhage, and (b) replacement of blood loss. It has been stated that the earlier a change in the resiliency of the uterus is noticed the earlier the surgeon may operate justifiably. The operator must decide whether the uterus safely can be left in place. He must be prepared to do a hysterectomy if in his judgment a state of utero-apoplexy exists from hemorrhagic infiltration, or if the uterus is too exhausted to contract satisfactorily. It has been suggested that the operator note the response of the uterus to pituitrin before closing the abdomen. With a noncontracting uterus its removal is advised without delay. A flaccid uterus with blood in the abdominal cavity adds to the gravity of the condition. Low cervical section is advisable especially where manipulation or examination has preceded the operation. Attempts should be made to limit the length of time of the operation.

If an operating room is not available the case is not entirely hopeless although the prognosis is decidedly more serious. The cervix must be dilated. A bag must be used as a last resort. A version

may be indicated if the baby is alive and the cervix is already adequately dilated. If the baby is dead a craniotomy should be considered. Death of the fetus adds to the difficulties of a version. In all cases following delivery per vaginam the uterus should be packed. Matthews<sup>41</sup> says after giving small doses of morphine to soften the cervix and combat shock it may be well to follow with nasal applications of pituitrin every thirty minutes until contractions are improved and maintained. Artificial rupture of the membranes may be of considerable assistance. Repeated abdominal measurements; namely, the height of the fundus and circumference of the abdomen, frequent blood pressure readings and repeated blood counts are helpful in the attempt to guard against further concealed hemorrhage.

Polak<sup>42</sup> in 1931 reported sixteen cases of internal hemorrhage in which the Spanish windlass type of abdominal binder was used. His further treatment consisted of tight cervical-vaginal packing and rupture of the membranes. In 1936, Heffernan<sup>43</sup> further advised the Spanish windlass supplanted with cervico-vaginal tamponade as a measure of affording time for transfusions and other measures to improve the general condition of the patient. As mentioned earlier, Schute reported that vitamin E therapy had been exceedingly valuable in some of the milder cases. Advanced cases did not respond. He suggests that vitamin E neutralizes the estrogenic substance which, when in excess, resists the invasion of the placental villi into the uterine wall.

Recent investigation has brought to light a new treatment in the form of vitamin K. Many patients with a condition of premature separation of the placenta show a tendency to ecchymosis and extravasation elsewhere in the body, especially in case of the slightest injury to the tissue. In fact, this hemorrhagic tendency may have been a factor in initiating the premature separation. The value of vitamin K has been proved in a prothrombin deficiency. With the absence of vitamin K the formation and absorption of prothrombin are apparently inhibited. Stewart and Rourke<sup>44</sup> point out that certain conditions, even those without a decrease in the prothrombin level as chronic infections, malnutrition and cachexia may be benefited with vitamin K therapy, but recommended further study. Dameshek<sup>45</sup> states that although vitamin K deficiency seems to be a distinct entity limited solely to chronic obstructive jaundice, theoretically it might prove valuable in certain dietary deficiencies, severe hepatitis or intestinal malabsorption. With some reported successes this new treatment is worthy of further trial both prophylactically and therapeutically and both before and after delivery in which premature separation of the placenta has been a complication. The administration of calcium has been thought to be of some value in hemorrhagic cases, especially in those approaching exsanguination. Schumann<sup>46</sup> recently

has stressed the value of koagmin in hemorrhagic conditions. The oxalic acid content of this preparation is supposed to be its principal active ingredient.

#### CONCLUSIONS

An extensive review of the literature relative to premature separation of the placenta is given. In this literature no revolutionary opinions or ideas are revealed and many unexplained features of the condition remain to be solved. After considering at length the etiology of premature separation of the placenta one becomes convinced that the causative factors are not well understood; but, it is gratifying to observe that some definite progress in the understanding of the condition has been made. The different theories with their scattered experimental and clinical support may eventually culminate in the complete explanation of this complication of pregnancy. The unfavorable prognosis demands that the patient be given the immediate care of a trained specialist. There are, however, certain features of the condition that may require treatment before adequate consultation is available. It, therefore, behooves every physician practicing obstetrics to acquaint himself with so serious a complication. Thorough understanding of the condition will result in a better prognosis. No convincing evidence is derived from the statistical studies that would lead one to conclude that there has been any notable change in the incidence. An apparent increase has come with the more frequent recognition of the condition. Adequate prenatal care will reduce the mortality perceptibly. The fundamental principles of good obstetrics will continue to be the basis for treatment. A few of the newer tendencies in management show possibilities of high merit. These are not universally accepted but reported success in individualized cases show that they are worthy of consideration and further investigation.

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#### BIBLIOGRAPHY

1. Rigby: An Essay on the Uterine Hemorrhage Which Precedes the Delivery of the Full-grown Fetus, Williams Obstetrics by Stander, 7th Edition. London, 1776. p. 1099.
2. Goodell, W.: Am. J. Obst. 2:281-345, 1870. From Williams Obstetrics and Holmes.<sup>2</sup>
3. Holmes, R. W.: Ablatio Placentae, Am. J. Obst. 44:753, 1901.
4. DeLee, J. B.: Principles and Practices of Obstetrics, Philadelphia, W. B. Saunders Co. 1934. p. 479.
5. Schumann, E. A.: Textbook of Obstetrics, Philadelphia, W. B. Saunders Co. 1936, p. 398.
6. Scott, R. A.: Premature Separation of Normally Implanted Placenta, Surg. Gynec. & Obst. 38:450-460 (April) 1924.
7. Holmes, R. W.: The Relationship of Uteroplacental Apoplexy to Ablatio Placenta, Am. J. Obst. & Gynec. 6:517 (November) 1923.
8. Davis, M. E., and McGee, W. B.: Abruptio Placentae, Surg. Gynec. & Obst. 53:768 (December) 1931.
9. Bland, P. B., and Rakoff, A. E.: Treatment of Premature Separation of the Placenta, Am. J. Obst. & Gynec. 36:165 (July) 1938.
10. Goodell, J. R.: Toxemias of Pregnancy: Clinical and Pathological Study, J. A. M. A. 105:2121 (Dec. 28) 1935.
11. Davis, M. E.: Hemorrhage Late in Pregnancy, S. Clin. North America 15:737 (June) 1935.
12. Gardiner, J. P.: Delayed Labor Caused by Shortened or Short Umbilical Cord, J. A. M. A. 98:598 (Feb. 20) 1932.
13. Balasquide, L. A.: Abruptio Placentae Complicating Twin Pregnancy, Am. J. Obst. & Gynec. 29:608 (April) 1935.
14. Baird, D.: Maternal Mortality in Hospital; Review of 999 Fatal Cases, Lancet 1:295 (Feb. 8) 1936.
15. Winter: Ztschr. f. Geburtsh. u. Gynak. 11:398-408. From Williams Obstetrics by Stander, 7th Edition, 1776. p. 1101.
16. Hofmeier: Handb. der Geb., 2:1188. From DeLee's Principles and Practice of Obstetrics, 6th Edition. p. 479.
17. Fehling: Quoted from DeLee, Principles and Practice of Obstetrics, 6th Edition, p. 479.
18. Haden, R. L.: Principles of Hematology, Philadelphia, Lea & Febiger, 1939. p. 199.
19. Hofbauer, J.: Experimental Studies on Toxemias of Pregnancy. Can Histamine Poisoning Be Regarded as Etiologic Factor? Am. J. Obst. & Gynec. 12:159 (August) 1926.
20. Browne, F. J., and Dodds, G. H.: Further Experimental Observation on the Etiology of Accidental Hemorrhage and Placental Infarction, J. Obst. & Gynec. 35:661-692, 1928.
21. Datnow, M. M.: An Experimental Investigation Concerning Toxic Abortion Produced by Chemical Agents, J. Obst. & Gynec. 35:693-724, 1928.
22. Bartholomew, R. A., and Kracke, R. R.: Probable Role of Hypercholesterolemia of Pregnancy in Producing Vascular Changes in the Placenta, Predisposing to Placentas Infarction and Eclampsia, Am. J. Obst. & Gynec. 31:549 (April) 1936.
23. Deickmann, W. J.: Blood Chemistry and Renal Function in Abruptio Placentae, Am. J. Obst. & Gynec. 31:734 (May) 1936.
24. Morse, A. H.: Premature Separation of the Normally Implanted Placenta, Surg. Gynec. & Obst. 26:133-138 (February) 1918.
25. Couvelaire, A., and Couvelaire, R.: Pathogenesis of Uteroplacental Apoplexy, Gynec. et Obst. 36:143 (August) 1937. From Year Book of Obstetrics and Gynecology. DeLee and Greenhill. 1937.
26. Scrivner, W. de M., and Oertel, H.: Necrotic Sequestration of Kidneys in Pregnancy, J. Path. & Bact. 33:1071 (October) 1930.
27. Ash, J. E.: Bilateral Cortical Necrosis of Kidneys. Angioneurotic Anemia, Am. J. M. Sc. 185:71 (January) 1933.
28. Kelly, G. L.: Effects of Injections of Ovarian, Follicular and Anterior Pituitary Hormones on Conception and Pregnancy in Laboratory Animals, J. M. A. Georgia 22:164 (May) 1933.
29. Teel, H. M.: Effects of Injecting Anterior Hypophyseal Fluid on the Course of Gestation in the Rat, Am. J. Physiol. 79:170 (December) 1926.
30. Heim, K.: Monatschr. f. Geburtsh. u. Gynak. 104:1-22 (December) 1936. From Year Book of Obstetrics and Gynecology. DeLee and Greenhill. 1937.
31. Taylor, H. C., and Scadron, E. N.: Hormone Factors in the Toxemias of Pregnancy, Am. J. Obst. & Gynec. 37:963 (June) 1939.
32. Maxwell, J. P.: Vitamin Deficiency in the Antenatal Period; Its Effect on the Mother and the Infant, J. Obst. & Gynec. 39:764-776, 1932.
33. Evans, H. M.: Vitamin E, J. A. M. A. 99:469-475 (Aug. 6) 1932.
34. Schute, E.: Early Diagnosis of Abruptio Placentae and Its Treatment With Wheat Germ Oil, Am. J. Obst. & Gynec. 33:429 (March) 1937.
35. Schute, E.: Observation on Etiology of Abruptio Placentae and Its Response to Vitamin E Therapy, J. Obst. & Gynec. 44:121 (February) 1937.
36. Siddall, A. C.: Vitamin B. Deficiency As to Etiologic Factor in Pregnancy Toxemias, Am. J. Obst. & Gynec. 35:662 (April) 1938.
37. Falls, F. H.: Management of Obstetrical Hemorrhage, Radiol. Rev. & Mississippi Valley M. J. 59:77-84, (May) 1937.
38. Richardson, G. C.: Significance of Fetal Heart Tones in Ablatio Placentae, Am. J. Obst. & Gynec. 32:429 (September) 1936.
39. DeNormandie, R. L.: Premature Separation of the Placenta in Private Practice, Am. J. Obst. & Gynec. 31:325 (February) 1936.
40. Irving, F. C.: The Conservative Treatment of Premature Separation of the Normally Implanted Placenta, Am. J. Obst. & Gynec. 34:881 (November) 1937.
41. Matthews, H. B.: Hemorrhage During Pregnancy With Special Reference to That During Last Trimester, J. M. Soc. New Jersey 36:28-33 (January) 1939.
42. Polak, J. O.: Accidental Hemorrhage: Ablatio Placentae, Am. J. Obst. & Gynec. 21:218-233 (February) 1931.
43. Heffernan, R. J.: Abdominal Compression and Vaginal Tamponade in Treatment of Abruptio Placentae, New England J. Med. 214:370 (Feb. 20) 1936.
44. Stewart, J. D., and Rourke, G. M.: Prothrombin and Vitamin K Therapy, New England J. Med. 221:403 (Sept. 14) 1939.
45. Dameshek, W.: Medical Progress Hematology, New England J. Med. 221:8 (July 6) 1939.
46. Schumann, E. A.: Newer Concepts of Blood Coagulation and the Control of Hemorrhage, Am. J. Obst. & Gynec. 38:1002 (December) 1939.



# THE JOURNAL

of the

Missouri State Medical Association

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APRIL, 1940

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## EDITORIALS

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### THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

### 83d ANNUAL SESSION

An innovation of the 1940 Annual Session to be held in Joplin, April 29, 30 and May 1, will be a dinner for all members of the Association in honor of Past Presidents. For several years the Council has entertained Past Presidents on the evening preceding the Annual Session. The dinner this year will be on Monday evening and will be a combined social and business session. Dr. Nathan B. Van Etten, New York, President-Elect of the American Medical Association, will be the guest of the Association and will present an address. A round table discussion on "Problems in the Practice of Medicine" will be opened by Dr. Curtis H. Lohr, St. Louis, Chairman of the Council; Dr. Cyrus E. Burford, St. Louis, President-Elect; Dr. Herbert L. Mantz, Kansas City, Adviser, Woman's Auxiliary, and Dr. Morris B. Simpson, Kansas City, Chairman, Committee on Public Policy, answering the question "How We Think They Should Be Solved." Dr. James R. McVay, Kansas City, President, will preside at the dinner. All members, guests and the Woman's Auxiliary are invited to attend the dinner. It will be held at 6:30 p. m., Roof, Hotel Connor.

The Committee on Scientific Work is presenting a program that it believes will be valuable to all members. The program, which appears on page 178, includes the following out of state speakers: Dr. Heyworth N. Sanford, Chicago, Associate Clinical Professor of Pediatrics, Rush Medical College, University of Chicago; Dr. John H. Musser, New Orleans, Professor of Medicine, Tulane University of Louisiana School of Medicine; Dr. Everett D. Plass, Iowa City, Professor of Obstetrics and Gynecology, State University of Iowa College of Medicine; Dr. Cyrus C. Sturgis, Ann Arbor, Michigan, Professor of Internal Medicine, University of Michigan Medical School; Dr. Joseph W. Gale, Madison, Wisconsin, Associate Professor of Surgery, University of Wisconsin Medical School; Dr. Alfred I. Folsom, Dallas, Texas, Professor of Urology, Baylor University College of Medicine; Dr. Louis A. Buie, Rochester, Minnesota, Professor of Proctology, University of Minnesota Graduate School of Medicine; Dr. George W. Post, Chicago, Associate Professor of Surgery, University of Illinois College of Medicine; Dr. John W. Harris, Madison, Wisconsin, Professor of Obstetrics and Gynecology, University of Wisconsin Medical School, and Dr. Nathan B. Van Etten, New York, President-Elect of the American Medical Association.

Dr. John W. Harris, Madison, will present an address at a General Meeting but is primarily a guest of the Committee on Maternal Welfare and Infant Care. He will conduct a critique and round table discussion at the lunch of the Committee to be held at noon on Monday, the first day of the Session. All members are invited to attend this luncheon.

On Tuesday and Wednesday of the Session round table luncheon discussions will be held, conducted

principally by guest speakers. Dr. R. M. James, Joplin, will preside at the luncheon on Tuesday and Dr. H. A. Lowe, Springfield, at the one on Wednesday.

The Jasper County Medical Society will be hosts to members of the Association on Tuesday evening at a cocktail party and buffet dinner and entertainment. Courtesy cards to the two golf courses may be obtained from members of the Entertainment Committee.

The Committee on Hotels for the Session has requested that members plan to combine their reservations whenever possible, two members or more occupying a room. The number of rooms available is approximately 450 and judging by previous attendance and the number of reservations already made for the 1940 Session, the Committee feels that it will be necessary for members to combine their reservations in order to accommodate the attendance. A reservation blank appears on page 26 of the advertising section.

The House of Delegates will convene on Monday, April 29, at 9:30 a. m., Roof, Hotel Connor, and at 4:30 p. m. in the Empire Room, and on Wednesday, May 1, at 4:00 p. m. The Council will convene at a luncheon meeting on Monday and at 5:00 p. m. on Wednesday.

### JOPLIN

Joplin, Jasper County, where the Missouri State Medical Association will hold its 1940 Annual Session, April 29, 30 and May 1, as guests of the Jasper County Medical Society, was named for Rev. Harris G. Joplin, Methodist home missionary who settled in the vicinity in 1839.

Lead and zinc mining is closely associated with the history of Joplin. Lead was discovered on the site about 1849; zinc for many years was regarded as a useless by-product. The Civil War interrupted the embryonic mining activity and it was not until 1870 that it was resumed on a commercial scale. The trend to develop farming of every kind, stock raising, fruit growing and general agricultural activity, has not overshadowed industrial growth of the city but rather is closely coordinated with it.

A shallow valley divides the City of Joplin proper from East Joplin and it was in the latter place that the first community organization took place. John C. Cox, pioneer landowner and first postmaster, laid out the town of Joplin. Patrick Murphy and his partner created on the opposite ridge the town of Murphysburg. On March 14, 1872, the county court heeded a petition emanating from a mass meeting of the citizens of the two communities to incorporate the whole under the name of "Union City." A census taken that November showed a population of 2,707, almost evenly divided. A year later the population had increased to 4,000.

The most noteworthy influence in changing the character of the city in recent years has been the

establishment of the largest truck-in stockyards in the world. From the adjoining portions of Missouri, Arkansas, Kansas and Oklahoma truck loads of cattle, hogs, sheep and mules are taken to Joplin. Closely associated with the stockyards in developing the agricultural wealth of the district is the municipally operated Market Square. So active has this become with the wide use of trucks as carriers that the facilities have been increased many fold during the last two years.

Mining for the most part centers in the northeast Oklahoma field, having shifted from the area immediately adjacent to Joplin, but Joplin remains the headquarters for the industry and regards it as a local asset. The vast resources of this rich field make it a potential source of wealth for many years to come.

Joplin is located on highways 66, 71, 14, 57 and 43. Joplin has excellent hotel accommodations for the tourist or convention visitor. The city has twenty-two fine schools, beautiful churches and handsome residences.

Six railroads enter the city to carry out the products of an impressive list of manufacturing concerns and to transact the commerce of a shopping district which serves some half million persons who live within a two hour drive of the city. Eight concrete highways enter Joplin.

Joplin's products include leather goods, cigars, bakery products, housing insulation, flour and feed, tractors, timber, plumbers' supplies and machined articles.

The population (33,454 in 1930) is almost entirely white and composed of intelligent native stock. The climate at 1,000 feet above sea level is typical of the Ozark hill country.

Jasper County has excellent hospitals, the Freeman and the St. John's hospitals at Joplin, and the McCune-Brooks Hospital at Carthage.

### MISSOURI ACADEMY OF SCIENCE

The Medical Section of the Missouri Academy of Science will meet in joint session with the Sixth Councilor District of the Missouri State Medical Association at the Central Missouri State Teachers College, Warrensburg, April 18 and 19. Dr. M. Pinson Neal, Columbia, is chairman of the Medical Section and Dr. A. J. Campbell, Sedalia, is Councilor of the Sixth District. The Rev. Alphonse M. Schwitalla, S. J., St. Louis, Dean of the St. Louis University School of Medicine, will address a general public session on April 18 at 8 p. m.

The program on April 19 will consist of presentations by Dr. Edwin Henry Schorer, Kansas City, on "The Rationale of Public Health Development"; Dr. Claude R. Bruner, Columbia, "Sinusitis"; Dr. James R. McVay, Kansas City, President of the State Association, "Cancer of the Gastrointestinal Tract"; Dr. Cyrus E. Burford, St. Louis, President-Elect of the State Association, "Urinary Stasis, A



Common Cause of Destructive Tissue Change, Stone Formation and Bacterial Invasion"; Dr. Quitman U. Newell, St. Louis, President-Elect, Southern Medical Association, "Retrodysplacement of the Uterus"; Dr. Alphonse McMahon, St. Louis, Vice President, American Medical Association, "Aminophyllin, Its Uses and Its Effect Upon the Electrocardiogram"; Dr. Richard L. Sutton, Kansas City, "Acne Vulgaris; New Concept of Etiology; Effective and Dependable Treatment: Acne Vulgaris; A Disturbance of Lipoid Metabolism."

The annual banquet of the Missouri Academy of Science will be held at 6:30 p. m. to which the Medical Section is invited. Dr. Alphonse McMahon, St. Louis, will speak on "What the Medical Profession Is Doing to Care for Its Own Problems" at the banquet and Dr. E. R. Walker, Ph.D., Professor of Philosophy, Central College, Fayette, will speak on "Philosophy and Science."

The full program of the meetings of the Academy of Science may be obtained by addressing Prof. R. T. Dufford, Secretary, 212 Physics Building, Columbia, Mo.

#### ST. LOUIS CLINICS

The St. Louis Clinics annual postgraduate course and clinical conference will be held from May 13 through May 16. An intensive course in various branches of medicine, surgery and surgical specialties will be offered. Recent advances in medicine, new methods of diagnostic technic and recent therapeutic advancements will be discussed. All talks and demonstrations will be strictly clinical.

The conference will be given by members of the medical profession of St. Louis including faculty members of the two Class A medical schools, St. Louis University and Washington University. An additional feature will be the participation in the program of several of the outstanding medical officers of the Army and Navy.

Daily programs will be presented from 9:00 a. m. to 5:00 p. m. Two evening programs will be presented and three round table luncheon discussions.

Early registration is urged so that arrangements may be made for accommodations. The registration fee of \$10 includes the round table luncheons. For information address The St. Louis Clinics, 3839 Lindell Blvd., St. Louis.

#### NEWS NOTES

The Trudeau Club of St. Louis met March 7 at the St. Louis Medical Society Building. Dr. Robert A. Moore, St. Louis, spoke on "The Exogenous Origin of Pulmonary Tuberculosis in Adults."

The fifth Leo Loeb Lecture under the lectureship established by the Mu Chapter of the Phi Beta Pi Medical Fraternity, Washington University School

of Medicine, was delivered by Dr. Paul R. Cannon, Chicago, on March 8. Dr. Cannon's subject was "Some Aspects of Allergy."

The American Surgical Association will convene in St. Louis on May 1, 2 and 3 with headquarters at the Park Plaza Hotel. Sessions will be held each day at 9:00 a. m. and 2:00 p. m. A dinner will be held on Thursday evening for members and invited guests.

Drs. Andy Hall, Dean Sauer, Joseph C. Jaudon and Clinton W. Lane, St. Louis, appeared on the program of a sectional postgraduate meeting of the Illinois State Medical Society at Duquoin, Illinois, on March 8. Dr. Hall spoke on "Urinary Tract Infections," Dr. Sauer on "Hand Infections," Dr. Jaudon on "Problems of the Newborn," and Dr. Lane on "Common Skin Infections."

Dr. Albert H. Hamel, St. Louis, was honored at a reception at the home of his son, Mr. Ellis H. Hamel, Webster Groves, on March 10, in commemoration of the anniversary of his fiftieth year in the practice of medicine. Dr. Hamel was president of the Missouri State Medical Association in 1922 and presided at Jefferson City. Dr. Hamel was graduated from the St. Louis Medical College in 1890 and practiced for several years in his native city, DeSoto, before going to St. Louis.

The St. Joseph Clinical Society presented its ninth annual two day spring clinic on March 20 and 21 at the Hotel Robidoux, St. Joseph. Dry and wet clinics, round table discussions, a pre-convention evening session open to the public, a banquet in conjunction with the Buchanan County Medical Society and formal presentations by guest speakers composed the program. Officers of the society are: President, Dr. Charles Greenburg; first vice president, Dr. Cabray Wortley; second vice president, Dr. Frank X. Hartigan; secretary, Dr. E. E. Wadlow; treasurer, Dr. H. E. Peterson; clinical directors, Drs. T. L. Howden and James O'Donoghue; publicity secretary, Dr. Jacob Kulowski.

Physicians under 35 years of age who are desirous of obtaining extended active duty with the Army but who do not hold Reserve commissions are being offered appointments in the Medical Corps Reserve in the grade of First Lieutenant in order to permit them to be placed on such duty. Medical Reserve officers are being used to augment the entire Army Medical Service which includes everything from small unit installations to large station hospitals, general hospitals and hospitals designed primarily for the treatment of specific diseases. It is hoped that authority will be granted to permit some officers to go to Hawaii and Panama. The pay and allowances for officers approximates

\$263 a month for a first lieutenant who is married and \$225 for one who is single; \$316 for a captain who is married and \$278 for one who is single. Applications for one year of active duty or for appointment in the Medical Corps Reserve with a view to obtaining one year of active duty with the Army should be made to the Commanding General of the Corps Area. Missouri is in the Seventh Corps Area with headquarters in the Federal Building, Omaha, Nebraska.

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Nonofficial Remedies:

#### Abbott Laboratories

Tablets Barbitol—Abbott, 5 grains

Capsules Estriol—Abbott, 0.24 mg.

#### Drug Products Co.

Hyposols Bismuth Subsalicylate in Oil, 60 cc. size vial

#### Gane's Chemical Works

Pentobarbital Sodium.

#### Gilliland Laboratories, Inc.

Antipneumococcic Rabbit Serum, Type I

Antipneumococcic Rabbit Serum, Type II

Antipneumococcic Rabbit Serum, Type V

Antipneumococcic Rabbit Serum, Type VII

Antipneumococcic Rabbit Serum, Type VIII

#### Hille Laboratories

Unguentum Lunosol 5 per cent—Hille

Unguentum Lunosol 10 per cent—Hille

#### International Vitamin Corporation

I. V. C. Halibut Liver Oil with Viosterol

(A. R. P. I. Process) in Oil

Capsules I. V. C. Halibut Liver Oil with Viosterol (A. R. P. I. Process) in Oil, 3 minims

#### Eli Lilly & Co.

Pulvules Sulfanilamide, 0.13 Gm. (2 grains)

Pulvules Sulfanilamide, 0.325 Gm. (5 grains)

#### Mallinckrodt Chemical Works

Hippuran

Hippuran (Crystals) 12 Gm., 100 Gm. and 500 Gm. bottles

Sterile Solution Hippuran, 25 cc. size

Magnesium Trisilicate—Mallinckrodt

#### Wm. S. Merrell Company

Ampuls Sodium Cacodylate—Merrell, 0.05 Gm. ( $\frac{3}{4}$  grain), 1 cc.

Ampuls Sodium Cacodylate—Merrell, 0.1 Gm. ( $1\frac{1}{2}$  grains), 1 cc.

Ampuls Sodium Cacodylate—Merrell, 0.2 Gm. (3 grains), 1 cc.

Ampuls Sodium Cacodylate—Merrell, 0.324 Gm. (5 grains), 1 cc.

Ampuls Sodium Cacodylate—Merrell, 0.454 Gm. (7 grains), 1 cc.

#### National Drug Company

Tuberculin Intracutaneous for Mantoux Test, one 1 cc. ampule (single test) packages

Tuberculin Intracutaneous for Mantoux Test, one 5 cc. ampule (single test) packages

Parke, Davis & Co.

Tablets Sulfapyridine—P. D. & Co., 0.5 Gm. (7.7 grains)

Bismuth Salicylate in Oil—P. D. & Co., 30 cc. bottle

Bismuth Salicylate in Oil—P. D. & Co., 500 cc. bottle

#### Smith, Dorsey Company

Capsules Ephedrine Sulfate, 0.048 Gm. ( $\frac{3}{4}$  grain)

Capsules Ephedrine Sulfate, 0.025 Gm. ( $\frac{3}{8}$  grain)

#### E. R. Squibb & Sons

Antipneumococcic Rabbit Serum, Type I

#### Frederick Stearns & Co.

Stearns Ascorbic Acid Tablets, 25 mg.

#### The Upjohn Co.

Ampoules Sodium Cacodylate—Upjohn, 0.05 Gm. ( $\frac{3}{4}$  grain), 1 cc.

Ampoules Sodium Cacodylate—Upjohn, 0.1 Gm. ( $1\frac{1}{2}$  grains), 1 cc.

Ampoules Sodium Cacodylate—Upjohn, 0.2 Gm. (3 grains), 1 cc.

Ampoules Sodium Cacodylate—Upjohn, 0.32 Gm. (5 grains), 1 cc.

Ampoules Sodium Cacodylate—Upjohn, 0.45 Gm. (7 grains), 1 cc.

Ampoules Sodium Cacodylate—Upjohn, 0.97 Gm. (15 grains), 2 cc.

## ORGANIZATION ACTIVITIES

### PRESIDENTS' AND SECRETARIES' MEETING

A joint executive luncheon meeting of the officers of the Association and the presidents and secretaries of component county medical societies was held in Jefferson City, 12:00 noon, March 10, Dr. James R. McVay, Kansas City, President, presiding. One hundred three, representing forty-one medical societies embracing fifty-four counties and members of the Council, were in attendance.

Various problems affecting community health and the practice of medicine in general were discussed.

The assembly was addressed by Dr. Curtis H. Lohr, St. Louis, Chairman of the Council; Dr. Cyrus E. Burford, St. Louis, President-Elect; Dr. Morris B. Simpson, Kansas City, Chairman, Committee on Public Policy; Dr. Harry F. Parker, State Commissioner of Health; Dr. James Stewart, Jefferson City, member, Committee on Public Policy, and Dr. E. H. Skinner, Kansas City, member of the Central Committee of the National Physicians' Committee for the Extension of Medical Service. A round table discussion followed these presentations.

In view of the limited time available and the nearness of the Annual Session, it was announced that further consideration of the problems pre-



sented had been planned at the dinner meeting to be held on the first day of the Joplin Session, April 29. Details of the dinner meeting and the continued round table discussion will be found on page 180 of this issue.

At the suggestion of Dr. H. S. Langsdorf, St. Louis, President of the St. Louis Medical Society, the following telegram was sent to Dr. Albert H. Hamel, St. Louis, former President of the Association:

"The Presidents and Secretaries of county medical societies and the officers of the Missouri State Medical Association in joint session in Jefferson City today congratulate you, their former President, on the completion of fifty years in the practice of medicine and express their esteem and regard for you."

The meeting adjourned at 3:10 p. m.

PROPOSED CONSTITUTION

The following proposed Constitution was introduced at the 1939 Excelsior Springs Session of the Association.

ARTICLE I—NAME

The name and title of this organization shall be the Missouri State Medical Association, and by such name shall have the right to contract and be contracted with, to plead and implead, to sue and be sued, and shall have the right to acquire, own, hold, mortgage and dispose of such real and personal property as shall be necessary for a proper maintenance and conduct of its affairs.

ARTICLE II—PURPOSES

The purposes of this Association shall be to bring into one compact organization the medical profession of the State of Missouri; to extend medical knowledge and advance medical science; to elevate the standards of medical education; to promote friendly intercourse among physicians; to safeguard the professional integrity of its members and to establish and maintain them in appropriate and equitable relationship with the public, with the government and with all agencies working in the field of health and welfare; and to enlighten and direct public opinion in regard to the problems of medicine and health for the best interest of the people of the state.

ARTICLE III

This Association shall have the right to enact By-Laws providing for the government, management and control of the Association.

BUDGET FOR 1940

Salaries (office and JOURNAL) .....	\$12,500.00
Printing of THE JOURNAL .....	7,000.00
Public Relations .....	2,000.00
Defense .....	1,000.00
Postage .....	700.00
Postgraduate Instruction .....	1,200.00
Printing and Stationery .....	700.00
Traveling Expenses of Executive Secretary .....	1,100.00
Telephone and Telegraph .....	600.00
Rent of Office and Light .....	1,200.00
Meetings:	
Annual Session	
Council and Councilor Expenses	
Committee Meetings and Conferences	
Delegates to A. M. A. }	3,000.00
General Expense and Miscellaneous .....	750.00
	\$31,750.00

FINANCIAL STATEMENT FOR 1940

R. A. LENNERTSON & COMPANY  
ACCOUNTANTS  
SAINT LOUIS

ROBERT A. LENNERTSON  
CERTIFIED PUBLIC ACCOUNTANT

MEMBER AMERICAN INSTITUTE  
OF ACCOUNTANTS

March 4, 1940.

Missouri State Medical Association,  
St. Louis, Missouri.  
Gentlemen:

- Pursuant to audit engagement, we have examined the accounts of the Missouri State Medical Association for the year 1939 and prepared therefrom the following attached statements:
- Exhibit A. Balance Sheet.
  - Exhibit B. Statement of Income and Expenses.
  - Exhibit C. Summary of Cash Receipts and Disbursements by Funds.
  - Exhibit D. Dues Receivable and Membership by Counties.

SCOPE OF EXAMINATION

The asset and liability accounts, as set forth in Exhibit A, were substantiated by comparison with the records of the Association. The recorded cash transactions for the year were examined and the cash receipts were traced in total into the Treasurer's bank account as deposits. Paid checks, purchase invoices and other data were seen in verification of the disbursements for the period. Selective tests were made of the income from dues and JOURNAL advertising and our tests indicate that the income from these sources has been properly accounted for on the books of the Association. Space in THE JOURNAL not occupied by articles, editorials and paid advertising has been filled by publishing reciprocal and complimentary advertisements.

STATEMENT OF INCOME AND EXPENSES

Exhibit B presents the details of the Association's income and expenses for the year 1939. The financial result of its activities was an excess of income over expenses in the amount of \$808.21 of which amount \$749.41 was derived from general activities and the balance of \$58.80 from THE JOURNAL publication. A comparative summary of income and expenses for the past two years follows:

	Year 1938	Year 1939	Increase
Income .....	\$32,336.80	\$34,681.02	\$ 2,344.22
Expenses .....	33,522.70	33,872.81	350.11
Net Income or (Loss) .....	\$(1,185.90)	\$ 808.21	\$ 1,994.11

All activities for the year 1939 show a larger income than the preceding year. Members' dues are taken into earnings when actually collected, whereas other items of income and expenses are taken up on the books of the Association in the period to which they apply.

BALANCE SHEET

The balance sheet, Exhibit A, presents the asset and liability accounts of the Missouri State Medical Association as of December 31, 1939, and shows that the Association is in a sound financial condition.

The cash balance in the sum of \$10,564.04 consisted of:

Treasurer's Account .....	\$10,247.24
Secretary's Account .....	291.80
Petty Cash Fund .....	25.00
	\$10,564.04

Certificates were obtained from the banks in verification of the cash on deposit and the amounts reported were reconciled with the cash book balances. The petty cash fund in the sum of \$25.00 was verified by actual count.

Accounts receivable due from advertisers in the amount of \$1,066.81 were substantiated by an examination of the individual ledger accounts. These accounts are classified as to age as follows:

Advertising, Fourth Quarter 1939 .....	\$ 634.56
Advertising, Third Quarter 1939 .....	65.25
Advertising prior to July 1, 1939 .....	367.00
	\$1,066.81

During the year 1939, accounts in the sum of \$303.50 were charged off as uncollectible and the balance remaining at December 31 is regarded as good and collectible by the management. Members' individual ledger accounts were seen in verification of the dues receivable in the sum of \$4,451.00 which is classified by years as follows:

1939 .....	\$2,371.00
1938 .....	816.00
1937 .....	432.00
1936 and prior .....	832.00
	\$4,451.00

This sum represents delinquent dues receivable which are set forth on the balance sheet as an asset account, offset on the liability side by a reserve for uncollected dues. Exhibit D is a statement of the dues receivable and the membership of the Association by counties at December 31, 1939. The membership of 3,291 members consists of 262 honor members, 2,836 active members and 193 junior members.

The furniture and fixtures account is again stated in the amount of \$1,000.00, additions during the year in the sum of \$38.75 having been charged to expense in lieu of depreciation.

Fire insurance in the sum of \$1,000.00 is carried on office equipment, books and supplies.

Prepaid expenses in the sum of \$779.52 represents the cost of JOURNAL printing, postage, stationery, etc., which is properly chargeable against the year 1940.

The records of the Association were carefully reviewed at the close of the year for liabilities and as a result, it is believed all the liabilities of the Association are set forth in the attached balance sheet, Exhibit A. The accounts payable are stated in the sum of \$1,076.54, consisting of supply and expense items of \$977.65 and advance payments by advertisers in the amount of \$98.89. We were informed that sixteen malpractice suits are now pending against members for which a contingent liability in the sum of \$4,800.00 is shown on the balance sheet. It should be noted that the cost of defense of malpractice suits by the Association in the past years has been nominal in amount.

## GENERAL

Fidelity bonds in favor of the Missouri State Medical Association covering the Treasurer in the sum of \$20,000.00 and the Executive Secretary in the sum of \$1,000.00 were presented for our inspection.

The books and records examined by us were found to have been well maintained throughout the year and followed the same basis of accounting as used in the preceding year.

Yours very truly,

R. A. LENNERTSON AND COMPANY,

By R. A. Lennertson,

Certified Public Accountant.

EXHIBIT A.

### Missouri State Medical Association Balance Sheet as of December 31, 1939

Assets			
Cash:			
General Fund	\$ 3,675.29		
Public Relations Fund	1,503.74		
Sinking Fund	4,269.00		
Defense Fund	1,116.01	\$10,564.04	
Accounts Receivable—Advertisers	1,066.81		
Dues Receivable—Exhibit D	4,451.00		
Furniture and Fixtures	1,000.00		
Prepaid Expenses—JOURNAL Printing, Postage,			
Stationery	779.52		
	\$17,861.37		
Liabilities			
Accounts Payable:			
Supplies and Expense	\$ 977.65		
Advance Payments by Advertisers	98.89	\$ 1,076.54	
Contingent Liability:			
To Members on 16 Malpractice Suits	\$ 4,800.00		
Reserve for Uncollected Dues	4,451.00		
Reserve for Fund Balances:			
General Fund	\$ 3,675.29		
Public Relations Fund	1,503.74		
Sinking Fund	4,269.00		
Defense Fund	1,116.01	10,564.04	
Surplus	1,769.79		
	\$17,861.37		

EXHIBIT B.

### Missouri State Medical Association Statement of Income and Expenses for the Year 1939

General JOURNAL Activities Publication Together			
INCOME:			
Dues Received (Includes \$1.00 Per Member Annually for THE JOURNAL)	\$19,975.00	\$ 2,946.00	\$22,921.00
Rentals—Annual Session Ex- hibit Space	710.00		710.00

Rent from Subtenant (office space)	540.00		540.00
Subscriptions to THE JOURNAL —Nonmembers		34.90	34.90
Advertising Space—THE JOUR- NAL		10,475.12	10,475.12
Total Income	\$21,225.00	\$13,456.02	\$34,681.02

## EXPENSES:

Officers' Salaries	\$ 5,638.10	\$ 2,905.32	\$ 8,543.42
Office Salaries	2,600.00	1,400.00	4,000.00
Office Rent and Light	1,630.90		1,630.90
Postage	505.85	352.48	858.33
Stationery, Printing and Office Supplies	677.29		677.29
THE JOURNAL—Paper, Printing, Mailing		7,087.46	7,087.46
Telephone and Telegraph	700.49		700.49
Insurance	58.73		58.73
Fees, Taxes and General Ex- pense	654.54		654.54
Bad Debts		303.50	303.50
Cash Discounts to Advertisers		401.93	401.93
Commissions on JOURNAL Ad- vertising		946.53	946.53
Traveling Expense — General Badges	1,089.70		1,089.70
Meetings (\$4,712.41):			
Annual Session	2,024.80		2,024.80
Council Meetings	559.16		559.16
Councilors' Expenses	617.31		617.31
Delegates to A. M. A.	26.60		26.60
Committees and Confer- ences	988.58		988.58
Postgraduate Instructions	495.96		495.96
Equipment Purchases Charged Off in Lieu of Depreciation	38.75		38.75
Public Relations Expense	1,963.89		1,963.89
Defense—Malpractice Suits	104.75		104.75
Total Expense	\$20,475.59	\$13,397.22	\$33,872.81
Net Income for the Period	\$ 749.41	\$ 58.80	\$ 808.21

EXHIBIT C.

### Missouri State Medical Association Summary of Cash Receipts and Disbursements by Funds for the Year 1939

	General Fund	Public Relations Fund	Sinking Fund	Defense Fund
Balance January 1, 1939	\$ 1,528.12	\$ 2,761.63	\$ 4,269.00	\$ 1,220.76
Receipts	50,541.39			
Transfer of Funds	2,240.00	2,946.00		
Total to Be Accounted For	\$54,309.51	\$ 5,707.63	\$ 4,269.00	\$ 1,220.76
Disbursements	\$47,688.22	\$ 1,963.89		\$ 104.75
Transfer of Funds	2,946.00	2,240.00		
Total Disbursements	\$50,634.22	\$ 4,203.89		\$ 104.75
Balance December 31, 1939	\$ 3,675.29	\$ 1,503.74	\$ 4,269.00	\$ 1,116.01

### Fund Balances on December 31, 1939

General Fund	\$ 3,675.29
Public Relations Fund	1,503.74
Sinking Fund	4,269.00
Defense Fund	1,116.01
Total	\$10,564.04

## Represented by:

Mercantile Commerce Bank and Trust Com- pany—Treasurer's Account	\$10,247.24
Mercantile Commerce National Bank—Sec- retary's Account	291.80
Petty Cash Fund	25.00
Total	\$10,564.04



EXHIBIT D.

Missouri State Medical Association

Dues Receivable and Membership by Counties  
as of December 31, 1939

Counties	1936 and Prior	Dues Receivable				Total	Pre- paid Dues	Num- ber of Mem- bers
		1937	1938	1939				
Adair-Schuyler- Knox Sullivan- Putnam .....		\$ 8	\$ 8	\$ 8	\$ 24			34
Andrew .....				8	8			7
Atchison-Gentry- Nodaway Worth .....	\$120	40	48	80	288	\$ 16		42
Audrain .....			8	8	16			16
Barry .....								11
Barton .....	16	8	24	32	80			10
Bates .....							8	11
Benton .....				4	4			6
Boone .....								41
Buchanan .....			16	112	128		56	100
Butler .....		8	24	56	88			18
Caldwell-Livingston .....			24	40	64			15
Callaway .....				20	20			21
Camden .....							16	2
Cape Girardeau .....			8	24	32			40
Carroll .....	40	8	8	8	64			8
Carter-Shannon .....								7
Cass .....				24	24			19
Chariton .....							56	17
Christian .....	40	8	8	16	72			7
Clay .....	16	16	24	40	96		16	29
Clinton .....							80	10
Cole .....			16	40	56		8	37
Cooper .....	88	32	32	72	224			20
Dallas-Hickory- Polk .....								15
DeKalb .....								3
Dent .....								8
Dunklin .....	56	16	24	32	128			21
Franklin .....				8	8			23
Gasconade-Maries- Osage .....	96	24	24	31	175			5
Greene .....	48	40	48	104	240			102
Grundy-Daviess .....	40	16	24	24	104		48	22
Harrison .....	48	8	8	16	80			7
Henry .....			8	24	32			16
Holt .....								7
Howard .....								9
Jackson .....				16	16		40	576
Jasper .....				24	24			61
Jefferson .....			16	24	40			19
Johnson .....								18
Laclede .....		8	8	8	24			13
Lafayette .....			8	36	44			30
Lawrence-Stone .....		8	8	8	24			22
Lewis-Clark- Scotland .....	16	16	16	24	72			12
Lincoln .....								10
Linn .....								13
Macon .....								6
Marion-Ralls .....	8	32	32	48	120			32
Mercer .....							16	8
Miller .....							64	8
Mississippi .....			16	16	32			7
Moniteau .....								6
Montgomery .....				8	8			6
Morgan .....								3
New Madrid .....	56	16	16	16	104			4
Newton .....								13
Pemiscot .....		8	16	32	56		56	17
Perry .....							32	4
Pettis .....							4	32
Phelps Crawford .....		16	24	48	88			23
Pike .....			8	8	16			13
Platte .....		8	8	24	40			13
Pulaski .....								6
Randolph-Monroe .....			16	40	56			29
Ray .....	40	24	24	40	128			13
St. Charles .....				8	8			30
St. Francois-Iron- Madison- Washington- Reynolds .....								48
Ste. Genevieve .....							48	41
St. Louis County .....			16	84	100			6
St. Louis City .....	24	8	88	860	980		96	190
Saline .....	16	16	16	16	64			26
Scott .....			16	16	32			13

Shelby .....		8	8	16	32			7
South Central .....	8	16	24	48	96	16		32
Stoddard .....	56	8	8	8	80			9
Taney .....								2
Vernon Cedar .....			8	32	40			31
Wayne .....		8	32	32	72			4
Webster .....								4
Totals .....	\$832	\$432	\$816	\$2371	\$4451	\$724		3291

MEDICINE MUST COMBAT EVIL EFFECTS  
OF THE GRANTS-IN-AID SYSTEM

If the pattern of financing states by federal grants-in-aid is to become a fixed part of the distribution of medical and health services, the medical profession must continue to take a sympathetic interest in distribution methods in order to avoid, where possible, the losses and abuses always accompanying such grants. R. G. Leland, M.D., director of the Bureau of Medical Economics of the American Medical Association, Chicago, declares in *The Journal* of the Association for March 23.

Pointing out the loss of local control and autonomy under such a system, he states that for the fiscal year ending June 30, 1939, the payments to states under that portion of the Social Security Act concerned with public health work totaled \$7,985,119.61.

"On January 1, 1939, annual appropriations for health work, in the cooperative projects alone, from local and state sources totaled \$44,861,322, an increase of more than \$13,000,000 in four years," he says.

"The expenditure of federal funds through grants-in-aid under the several titles of the Social Security Act for the fiscal year ended June 30, 1938, was \$275,000,-629.80. The amount estimated to be necessary for the year ended June 30, 1939, was \$323,000,000 and for the fiscal year ending June 30, 1940, for the same purposes, \$343,150,000.

"Grants-in-aid are always accompanied by some rules, regulations and standards of administration. The rules and regulations constitute a leveling process by which direction and control are centralized, local control and autonomy are lost, and each part of the country which accepts grants-in-aid funds is required to fit the same federal mold; standards are usually minimum and when applied to the distribution of medical services actually may operate as a secondary system of licensure."

VITAMIN B<sub>12</sub> BENEFITS SIX PATIENTS  
WITH MUSCULAR WEAKNESS

Improvement or recovery of six patients from muscular weakness and incoordination occurred after injections of vitamin B<sub>12</sub>, William Antopol, M.D., and Clement E. Schotland, M.D., Newark, N. J., report in *The Journal of the American Medical Association* for March 23.

The condition of the patients before treatment with vitamin B<sub>12</sub> was characterized by a waddling gait, difficulty in rising from the sitting and reclining positions, fatigue on walking and general bodily muscle weakness. In addition to the foregoing symptoms some of the patients also had a forward curvature of the spine.

All or some of these symptoms were no longer complained of after treatment. Improvement was stationary in five patients; relapse, with a continued downward course, occurred in one patient.

The technical term for the disorder of these patients is pseudohypertrophic muscular dystrophy.

"In view of the promising results, though the patients have not been cured and are still under treatment," Drs. Antopol and Schotland say, "this form of therapy is being studied further and is also being investigated in conjunction with other vitamins, particularly E and riboflavin (a constituent of the vitamin B complex), and with the drugs, aminoacetic acid and ephedrine."

## MISSOURI STATE MEDICAL ASSOCIATION

83rd Annual Meeting, Hotel Connor, Joplin

The 83rd Annual Session of the Association convenes at the Hotel Connor, Joplin, Monday, Tuesday and Wednesday, April 29, 30 and May 1, 1940.

## HOUSE OF DELEGATES

Roof, Hotel Connor

First Meeting—Monday, April 29, 1940—9:30 a. m.

## Order of Business

Report of Committee on Credentials.  
Reading of Minutes of Previous Meeting. (Published in July 1939 JOURNAL.)  
Election of Speaker of House of Delegates.  
Election of Vice Speaker of House of Delegates.  
Reading of President's Message and Recommendations.  
Appointment of Reference Committees:  
    Amendments to Constitution and By-Laws.  
    Resolutions.  
    Miscellaneous Affairs.  
    Medical Education and Public Welfare.  
Report of General Committee on Arrangements: H. L. Kerr, Crane.  
Report of Local Committee on Arrangements: Paul W. Walker, Joplin.  
Report of the Secretary.  
Report of the Treasurer.  
Report of Committees:  
    Scientific Work: J. E. Stowers, Kansas City, Chairman.  
    Postgraduate: C. H. Neilson, St. Louis, Chairman.  
    Publication: Walter Baumgarten, St. Louis, Chairman.  
    Public Policy: Morris B. Simpson, Kansas City, Chairman.  
    Defense: Charles E. Hyndman, St. Louis, Chairman.  
    Medical Education and Hospitals: L. W. Dean, St. Louis, Chairman.  
    Cancer: Dudley A. Robnett, Columbia, Chairman.  
    Medical Economics: Carl F. Vohs, St. Louis, Chairman.  
    Mental Health: G. Wilse Robinson, Sr., Kansas City, Chairman.  
    Maternal Welfare and Infant Care: Ralph R. Wilson, Kansas City, Chairman.  
    Health and Public Instruction: A. R. McComas, Sturgeon, Chairman.  
    Constitution and By-Laws: Floyd H. Spencer, St. Joseph, Chairman.  
    Fractures: M. L. Klinefelter, St. Louis, Chairman.  
    Conservation of Eyesight: C. P. Dyer, St. Louis, Chairman.  
    Control of Venereal Disease: G. V. Stryker, St. Louis, Chairman.  
Report of Special Committees:  
    Physical Therapy: A. J. Kotkis, St. Louis, Chairman.  
    Study of Medical Practice Laws: Lee D. Cady, St. Louis, Chairman.  
    Tuberculosis: E. E. Glenn, Springfield, Chairman.  
    Industrial Health: E. C. Funsch, St. Louis, Chairman.  
    Rural Medicine: H. A. Lowe, Springfield, Chairman.  
Appointment of Committee on Nominations.  
Unfinished Business.

*Recess Until 4:30 p. m.*

Report of the Council: Dr. Curtis H. Lohr, St. Louis, Chairman.  
Report of Reference Committees:  
    Amendments to the Constitution and By-Laws.  
    Resolutions.  
    Miscellaneous Affairs.  
    Medical Education and Public Welfare.  
New Business (Resolutions, Memorials, etc.).  
Selection of Place of Next Meeting.

Second Meeting—Wednesday, May 1, 1940—4:00 p. m.

Report of Committee on Credentials.  
Reading of Minutes.  
Election of Officers:  
    Election of President-Elect.  
    Report of Committee on Nominations.  
Report on Election of Councilors.  
Installation of President.  
Nominations for Standing Committees by President and Confirmation by House of Delegates.  
Unfinished Business.



## MATERNAL WELFARE COMMITTEE

### Annual Meeting

Monday, April 29, 1940—12:00 noon—Empire Room, Hotel Connor

Dr. Ralph R. Wilson, Kansas City, Chairman, Presiding

Selected Case Report of Maternal Death.

Questions submitted from the floor.

Critique of Report of Maternal Death and Discussion of Submitted

Questions .....Dr. John W. Harris, Madison, Wisconsin

Closed meeting for physicians only. All members of the Association are invited to attend and participate in the discussion. Tickets for the luncheon may be purchased at the door.

## GENERAL MEETING

Monday, April 29, 1940—2:30 p. m.—Roof, Hotel Connor

2:30 p. m. Studies in Blood Coagulation Disturbances

—Heyworth N. Sanford, M.D., Chicago



Blood coagulation disturbances may be divided into two groups: those in which a defect in the blood clotting mechanism may be shown, and those in which no coagulation disturbance may be demonstrated. In the last group there is presumed to be a vascular defect. In the first group lowering of the prothrombin and quantitative and qualitative platelet defects will account for the majority of conditions. In the second group vitamin deficiencies and allergic disturbances are frequently found. A basis for classification of these coagulation disturbances is thus given; and from this appropriate tests may be made that will show what coagulation elements are deficient. The various means by which these deficient coagulation elements may be corrected is discussed.

3:10 p. m. Pain Relief in Labor .....John W. Harris, M.D., Madison



The present day demand for pain relief in labor has reached such proportions that in many instances it has taxed the limits of safety for both mother and child. Stress is placed on the physiologic factors involved and the limitations of various procedures are noted. In the choice of pain relieving drugs, the patient herself, the environment in which the labor is conducted and, especially, the experience of the physician should be the determining factors.

3:50 p. m. Office and Hospital Management of Some Anorectal Disorders .....Louis A. Buie, M.D., Rochester, Minnesota



Various factors of importance to be considered in making examinations of the anus and rectum will be discussed. This will be followed by a discussion of the diagnostic features and the medical and surgical treatment of such conditions as hemorrhoids, fissures, fistulas and other common anorectal diseases.

## DINNER IN HONOR OF PAST PRESIDENTS

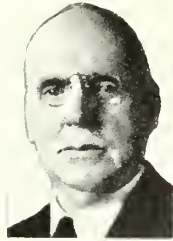
Monday, April 29—6:30 p. m.—Roof, Hotel Connor

Dr. James R. McVay, Kansas City, President, Presiding.

Tendered by Officers of the Association, Presidents and Secretaries of County Medical Societies, Members of the House of Delegates, Members of the Association and Their Ladies. Members of the Woman's Auxiliary and Visiting Guests Are Cordially Invited.

Remarks by the President, Dr. James R. McVay, Kansas City.

Introduction of Distinguished Guests.



Dr. Nathan B. Van Etten, New York,  
President-Elect American Medical  
Association

An American Health Program

Introduction of Past Presidents.

Round Table Discussion: Problems in the Practice of Medicine.

Opened: "How We Think They Should Be Solved."

Dr. Curtis H. Lohr, St. Louis, Chairman of the Council.

Dr. Cyrus E. Burford, St. Louis, President-Elect.

Dr. Herbert L. Mantz, Kansas City, Adviser, Woman's Auxiliary.

Dr. Morris B. Simpson, Kansas City, Chairman, Committee on  
Public Policy.

Questions and Open Discussion.

Dinner is informal. Members are urgently requested to purchase tickets as early as possible on Monday, April 29, at Registration Desk, Mezzanine Floor, Hotel Connor, to facilitate the necessary arrangements. Those arriving late may purchase tickets at the entrance to the Banquet Hall after 6:00 p. m.

## GENERAL MEETING

Tuesday, April 30, 1940—8:30 a. m.—Roof, Hotel Connor



8:30 a. m. Address of the President.  
James R. McVay, M.D., Kansas City



8:50 a. m. Address of the President-Elect.  
Cyrus E. Burford, M.D., St. Louis



9:10 a. m. The Importance of Protein Replacement in the Treatment of Severe Burns . . . Robert Elman, M.D., St. Louis

Many lives are lost, especially in childhood, because of the general manifestations produced by severe cutaneous burns. This is especially unfortunate because many burns although extensive are not deep and never require skin grafting provided only that the patient can be carried through the acute stage of the injury. Evidence has been accumulated indicating that loss of protein is a serious if not the only factor responsible for the extremely serious general manifestations and death; it is probably also responsible for the lack of resistance which leads to infection. Treatment by replacement of the lost protein produces dramatic results and will save many lives. The mechanism and magnitude of the protein loss and its practical replacement will be discussed.

9:30 a. m. The Prognosis and Treatment of Hypertension  
—Cyrus C. Sturgis, M.D., Ann Arbor

Patients with hypertension are divided into several groups as an aid in prognosis and treatment. The various causes of hypertension are discussed, methods of studying a patient are considered and a number of therapeutic agents including splanchnicectomy are evaluated. Special attention is given to the influence of certain psychic factors in the causation of hypertension.



10:00 a. m. The Role of the Female Urethra in Bladder Irritation in Women  
—Alfred I. Folsom, M.D., Dallas, Texas

10:30 a. m. Advances in the Management of Diabetes  
—Cyril M. MacBryde, M.D., St. Louis

10:50 a. m. Acute Suppurative Pleurisy  
—Joseph W. Gale, M.D., Madison, Wisconsin

The treatment of empyema is based upon certain physiologic and fundamental principles which must be adhered to in order to achieve the best results. Once improper treatment has been instituted two dangers lie ahead: first, immediate death; or second, the production of a chronic process leading to invalidism. The patient then will have to have a radical operation with the extensive removal of the chest wall. There is no other surgical condition in which early proper care will be rewarded with such brilliant success, nor is there any other pathologic process which, when improperly treated, will be followed by a larger percentage of disappointing results.

11:20 a. m. A Study of Diabetic Patients Under Observation for Ten Years With Special Reference to Arteriosclerosis  
—William H. Olmstead, M.D., St. Louis

ROUND TABLE LUNCHEON

Tuesday, April 30, 1940—12:00 noon—Empire Room, Hotel Connor

Luncheon Meeting

Dr. R. M. James, President, Jasper County Medical Society,  
Joplin, Presiding

Surgery . . . . . Joseph W. Gale, M.D., Madison, Wisconsin

Internal Medicine . . . . . Cyrus C. Sturgis, M.D., Ann Arbor, Michigan

Urology . . . . . Alfred I. Folsom, M.D., Dallas, Texas

Questions and Answers on Addresses of Guest Speakers.

## GENERAL MEETING

Tuesday, April 30, 1940—2:00 p. m.—Roof, Hotel Connor

- 2:00 p. m. Some of the Hazards in the Treatment of Hyperthyroidism .....E. V. Mastin, M.D., St. Louis

Some of the difficulties in making a differential diagnosis between hyperthyroidism and some conditions that resemble it are discussed together with the most common complications that arise in the course of the disease, both preoperatively and postoperatively. In order that these hazards may be most accurately dealt with, it is recommended that patients be under the joint supervision of the internist and surgeon throughout the course of the disease. The indications for the graded or multiple stage operation are discussed together with the type of anesthetic that is best fitted to the individual patient. Suggestions are made concerning the difficulties of the operation itself.

- 2:20 p. m. Some Practical Considerations in the Treatment of Chronic Gonorrhea

—Alfred I. Folsom, M.D., Dallas, Texas

- 2:50 p. m. Low Back Pain From the Orthopedic Point of View

—Frank D. Dickson, M.D., Kansas City

- 3:10 p. m. The Anemias of Pregnancy

—Cyrus C. Sturgis, M.D., Ann Arbor



In the last ten years a great deal of new information has been acquired regarding the anemias of pregnancy. Studies have shown that in general they may be divided into two main types; namely, macrocytic and microcytic anemia. Fifty-four per cent of routine admissions to the obstetrical department of the University Hospital, Ann Arbor, had a pathological anemia and 20 per cent of all pregnant women in a nearby county had a similar condition. The mechanism of the production of each type of anemia and effective methods of their treatment are discussed.

- 3:40 p. m. The Diagnosis of Pernicious Anemia

—M. Pinson Neal, Columbia

Pernicious anemia need no longer be considered a malignant and fatal disease. Specific therapy is available and effective if instituted early and continued. This makes it incumbent upon the practitioner of medicine to recognize the condition promptly. The diagnostic criteria will be presented, evaluated and discussed.

- 4:00 p. m. The Dynamics of Respiration

—Joseph W. Gale, M.D., Madison



The preoperative and postoperative disturbances in the dynamics of respiration are of the utmost importance to the surgeon. They may occur as the result of mechanical, chemical or bacteriological causes, or as a combination. The early recognition of these conditions permits correction through simple measures. If not diagnosed at its inception the condition may have progressed to a point at which treatment is unsatisfactory. A film will be shown to demonstrate the changes which occur in respiratory movements through the alteration of certain mechanical factors.

- 4:30 p. m. Heart Disease: Review of the Progress of a Decade

—Julius Jensen, M.D., St. Louis

The advances of cardiology during the last decade, the growth of organizations for the study of cardiovascular problems, the growth and establishment of cardiological journals, the addition of general texts and special monographs to cardiological literature will be reviewed. Diagnostic measures, electrocardiographic, roentgenological and other technical advances in the study of cardiovascular phenomena, the changes in fundamental views on heart diseases, the value of the etiological basis for classification of heart disease, the advances made in the preventive and curative treatment of syphilitic, rheumatic and degenerative forms of heart disease will be considered. The advances in digitalis therapy, the early use of diuretics and the establishment of the superiority of the mercurial diuretics will be summarized.



and the methods of estimating surgical and obstetrical work, and the various surgical procedures for cardiovascular disease will be evaluated.

- 4:50 p. m. The Small Encephalogram  
—B. Landis Elliott, M.D., Kansas City
- 5:15 p. m. Alumni and Fraternity Meetings.
- 6:00 p. m. Cocktail Party. Stag. Hotel Connor. Jasper County Medical Society, Host.
- 7:00 p. m. Buffet Dinner and Entertainment. Stag. Roof, Hotel Connor. Jasper County Medical Society, Host.

### GENERAL MEETING

Wednesday, May 1, 1940—8:30 a. m.—Roof, Hotel Connor

- 8:30 a. m. The Application of Gynecological Endocrinology to General Practice . . . . .Paul F. Fletcher, M.D., St. Louis

The different types of gynecological conditions that are due either directly or indirectly to endocrine disturbances are presented with an analysis of clinical manifestations from a gynecological point of view. A classification of the various endocrine products available for use at the present time and the citation of clinical conditions in which their use is indicated is included. An evaluation of dosage and method of administration with a short summary of results that have been obtained are given.

- 8:50 a. m. Undulant Fever . . . . .Hubert M. Parker, M.D., Kansas City

- 9:10 a. m. Functional Menstrual Disturbances  
—Everett D. Plass, M.D., Iowa City



Menstrual disturbances, unassociated with gross evidence of pelvic disease, are largely of endocrine origin. Intelligent therapy depends upon a knowledge of the physiology of menstruation and of the effects to be expected from the various endocrine products available. The anterior pituitary gland evidently controls the function of the ovaries and is in turn controlled to some extent by the other endocrine glands. Abnormal menstruation apparently results from disturbances of this hormonal balance and therapy aims to restore the balance by substitution or by stimulation. Menorrhagia, dysmenorrhea and menopausal phenomena are usually amenable to treatment but amenorrhea is more difficult to control.

- 9:40 a. m. Food Allergy . . . . .Herbert J. Rinkel, M.D., Kansas City

The diagnostic accuracy of skin testing in various forms of atopic allergy will be considered. The experience of the last few years indicates that too much diagnostic reliability is generally given skin testing, particularly in the case of foods. An evaluation of the necessary factors in patients with food allergy are contrasted against the proved reliability of skin tests. A brief outline of the minimal necessary diagnostic procedures in addition to cutaneous tests are outlined and detailed.

- 10:00 a. m. The Importance of Water Balance and the Electrolytes in the Preoperative and Postoperative Care of Surgical Patients . . . . .George W. Post, M.D., Chicago



Water composes about 70 per cent of the body weight and the normal human adult requires about 2500 cc. for his daily needs. The main alkaline elements, sodium, potassium, calcium and magnesium, are also essential in the blood stream and are replaced normally only by food. The essential chlorine can be replaced by  $\text{H}_2\text{CO}_3$ . The maintenance of normal metabolism is dependent on the presence of sufficient quantities of these substances. After hemorrhage, operation or other depleting conditions, the balance between these is lost and must be restored if the individual is to recover. Persons who are critically ill and whose balance has been greatly disturbed require this balance to be restored quickly as a life saving measure. Those less critically disturbed are far more comfortable and recover more easily and rapidly if the measures at hand are promptly employed to restore this balance.

10:30 a. m. The Diagnosis of Renal Lesions—Ira H. Lockwood, M.D.,  
and Arthur B. Smith, M.D., Kansas City  
Lesions of the kidney present many pitfalls in diagnosis. The clinical signs and symptoms are rarely pathognomonic. The interpretation of the initial symptoms is frequently misleading. Nausea, vomiting, malaise, indefinite abdominal pain, loss of weight or strength, nocturia, frequency of urination, hematuria and fever are some of the presenting symptoms.

10:50 a. m. Treatment of Some of the Contagious Diseases  
—John H. Musser, M.D., New Orleans  
A review will be presented of the common acute contagious diseases, seen on a large contagious disease service. Such diseases as scarlet fever, measles, erysipelas, meningitis, whooping cough and chickenpox will be discussed; particular reference will be made to the use of sulfanilamide preparations and some suggestions of minor moment concerning the handling of these disorders.

11:20 a. m. Treatment in the Anxiety States  
—John M. Sartin, M.D., Springfield  
The relation of increase in anxiety reactions to the threats to individual security and frustration of instinctual strivings present in our contemporary civilization is stressed. The nature of anxiety symptoms as expressions of autonomic imbalance, and their production of vicious cycles of worrisome thinking is emphasized. Treatment is discussed, including investigation of dynamic factors, formulation to patient, use of drugs and suggestion. The responsibility of the family physician in the care and treatment of these cases is urged.

### ROUND TABLE LUNCHEON

Wednesday, May 1, 1940—12:00 noon—Empire Room, Hotel Connor  
Luncheon Meeting

Dr. H. A. Lowe, Springfield, Chairman, Committee on  
Rural Medicine, Presiding.

Surgery.....George W. Post, M.D., Chicago  
Internal Medicine.....John H. Musser, M.D., New Orleans  
Obstetrics and Gynecology.....Everett D. Plass, M.D., Iowa City  
Pediatrics .....John Aull, M.D., Kansas City  
Questions and Answers on Addresses of Guest Speakers.

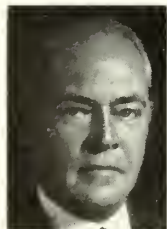
### GENERAL MEETING

Wednesday, May 1, 1940—2:00 p. m.—Roof, Hotel Connor

2:00 p. m. Surgical Management of Hyperinsulinism  
—L. P. Engel, M.D., Kansas City

The presentation will consist of a discussion of the various causes of hypoglycemia and the differential diagnosis of hyperinsulinism; the indications for exploration of the pancreas in search of an islet cell adenoma; a detailed description of the technic for the removal of pancreatic adenomata for subtotal pancreatectomy.

2:20 p. m. Some Facts Concerning Coronary Vascular Diseases  
—John H. Musser, M.D., New Orleans



The incidence, etiology and unusual expressions of coronary disease will be elaborated upon. There will be a résumé as well of the accepted forms of treatment applicable to coronary occlusion.



- 2:50 p. m. Intractable Asthma . . . . .H. L. Alexander, M.D., St. Louis  
Recently it has been emphasized that there is a great distinction between extrinsic and intrinsic asthma. The latter is identified by certain characteristics and it is this group that includes most patients with intractable asthma. The management of these patients includes measures for the immediate relief of attacks and general measures directed toward the disease itself. These, together with complications and prognosis, are discussed.
- 3:10 p. m. The Fibroid Uterus . . . . .Everett D. Plass, M.D., Iowa City  
Uterine fibromyomata seemingly are related to menstruation in that they do not appear before puberty and rarely grow or produce symptoms after the menopause, but are increasingly common near the end of sexual life. These tumors may lead to menstrual disorders or may produce pressure symptoms by their size and position. During pregnancy they may acquire considerable significance. Various types of degeneration develop but malignant change is rare. Diagnosis is usually easy but may be more difficult in the presence of certain other pelvic lesions. Treatment depends upon the age of the patient and the desire for more children as well as upon the size and location of the tumors and the resulting symptoms.
- 4:00 p. m. House of Delegates.
- 5:00 p. m. Council.

## COMMERCIAL EXHIBITS

### Mezzanine Floor, Hotel Connor

#### LEA & FEBIGER, 600 WASHINGTON SQUARE, PHILADELPHIA. BOOTH 1.

Lea & Febiger will exhibit new works and new editions. The new works include Adair's "Obstetrics and Gynecology," Packard's "Pneumothorax," Master's "Electrocardiogram of the Heart," Eller's "Tumors of the Skin," Schwartz' and Tulipan's "Occupational Diseases of the Skin," Clement's "Anesthesia," Hayden's "The Rectum and Colon," Carter, Green and Twiss' "Diseases of the Biliary Tract" and Witherspoon's "Gynecology." New editions of the following works will be shown: Fishberg's "Hypertension," Printz and Greenbaum's "Diseases of the Mouth," Wiggers' "Physiology," Boyd's "Pathology of Internal Diseases," Park and Williams' "Pathogenic Microorganisms," Kanavel's "Infections of the Hand" and many others.

#### C. B. FLEET CO., 921 COMMERCE STREET, LYNCHBURG, VA. BOOTH 2.

Phospho-Soda (Fleet), a saline laxative which has been presented to the medical profession for over fifty years, will be on display. This eliminant is suggested when a rapid nongripping action is desired. It is recommended in gallbladder disorders. The profession is cordially invited to visit the booth of C. B. Fleet Co.

#### HORLICK'S MALTED MILK CORPORATION, RACINE, WIS. BOOTH 3.

Nourishing, digestible, appetizing—these are the three outstanding qualities for which Horlick's is famous, whether in powder or tablet form. You will be interested in the many uses from infant feeding to old age. Note especially the convenience of the tablets in ulcer diets.

#### MEAD JOHNSON & COMPANY, EVANSVILLE, IND. BOOTH 4.

Mead Johnson & Company will not only exhibit several new products but will show various examples of their slogan "Servamus Fidem"—We Are Keeping The Faith.

#### LEDERLE LABORATORIES, 30 ROCKEFELLER PLAZA, NEW YORK. BOOTH 5.

Lederle Laboratories' exhibit will feature the latest on management of the pneumonias—Sulfapyridine, Sodium Sulfapyridine and Anti-Pneumococcic Sera of which all types (31 in all) are available. Also literature and information will be available on such items as Solution Liver Extract, Allergy, Digitalis, Globulin Modified Antitoxins (Scarlet Fever, Staphylococcus, Gas Gangrene), Vitamin B Complex (Emulsion, Capsules and Parenteral), Bellabulgara Tablets for Parkinson's Disease. Mr. J. G. Rea and Mr. G. D. Doyle will be in charge of the exhibit.

#### THE BORDEN COMPANY, 350 MADISON AVE., NEW YORK. BOOTH 6.

#### ELI LILLY AND COMPANY, INDIANAPOLIS, IND. BOOTH 7.

Eli Lilly and Company produced the first commercial preparation of insulin, contributed to development of liver therapy and has been responsible for many other therapeutic advancements. Information concerning all Lilly products will be available at the Lilly exhibit where Merthiolate (Sodium Ethyl Mercuri Thio-salicylate, Lilly), Sodium Amytal (Sodium Iso-Amyl Ethyl Barbiturate, Lilly) and other important products will be featured.

## GRADWOHL LABORATORIES, 3514 LUCAS AVE., ST. LOUIS. BOOTH 8.

The latest methods of blood typing and identification of blood spots, proofs of paternity by blood grouping methods and identification of human blood using reagents of exceptional value will be shown. Demonstrations will be made by request. Complete line of laboratory reagents for hospitals and private physicians will be shown, together with methods of teaching laboratory technic.

## MCINTOSH ELECTRICAL CORPORATION, 223 N. CALIFORNIA AVE., CHICAGO. BOOTH 9.

Old customers and friends of the McIntosh Electrical Corporation will find a welcome in Booth 9. The new No. 8870 Brevatherm with the improved air-spaced electrodes and arms, with elbows affording extreme flexibility of adjustment for every conceivable mode of application and also the new McIntosh No. 1518 Sinustat low voltage generator will be exhibited. Biolite infra red lamps and accessories will be displayed. Mr. Paul Read will be in charge of the exhibit and will greet the many physicians whom he has served.

## MEDICAL PROTECTIVE COMPANY, WHEATON, ILL. BOOTH 10.

The Medical Protective Company invites you to call at their booth. Medical Protective Service is an institution of the medical profession whose legal liability problems we have concentrated upon for forty one years. Bring your professional liability questions to our representative who is at your service to present our protection plan, to explain the peculiar relation of the doctor to the law which governs your practice or to discuss any particular phase of professional liability in which you are especially interested.

## SMITH, KLINE &amp; FRENCH LABORATORIES, 105 N. 5TH ST., PHILADELPHIA. BOOTH 12.

Smith, Kline & French Laboratories, believing that many physicians dislike efforts to make them register, have arranged their booth for self-service. Up-to-date information about Benzedrine Inhaler, Benzedrine Sulfate, Benzedrine Solution, Pentnucleotide, Feosol Tablets and Elixir, Oxo-ate "B," Eskay's Neuro Phosphates and Paredrine Hydrobromide with Boric Acid Ophthalmic may be obtained in convenient envelopes from literature dispensers. If additional data is desired, the representative will be glad to answer any questions.

## PHILIP MORRIS &amp; CO., LTD., 119 FIFTH AVE., NEW YORK. BOOTH 13.

Philip Morris & Company will demonstrate the method by which it was found that Philip Morris Cigarettes, in which diethylene glycol is used as the hygroscopic agent, are less irritating than other cigarettes. Their representative will be happy to discuss researches on this subject and problems on the physiological effects of smoking.

## HAMILTON-SCHMIDT SURGICAL COMPANY, 215 N. 10TH ST., ST. LOUIS. BOOTH 14.

The Hamilton Schmidt Surgical Company exhibit will be in charge of the Missouri representative, Mr. Frank Ritzen, who will demonstrate some new Burdick Physio-Therapy equipment, the Cutters Dextrose Intravenous solution and also some new instruments made by the Stille Co. of Sweden.

## PEVELY DAIRY COMPANY, 1001 S. GRAND, ST. LOUIS. BOOTH 15.

Pevely Dairy Company is exhibiting their Council Accepted Evaporated Milk. The use of evaporated milk has been quite universally adopted in infant feeding and has done a great deal to simplify dietary problems. It is always uniform in composition, easy to prepare and its economic cost is a great added feature.

## SCHERING CORPORATION, BLOOMFIELD, N. J. BOOTH 16.

Schering Corporation's representatives will be pleased to discuss latest developments in hormone therapy. New products on display will be Cortate (desoxycorticosterone acetate), Anteron (gonadotropic hormone from mares' serum), Pranturon (gonadotropic hormone from pregnancy urine), Pranone (orally effective progestin) as well as the other well known Schering preparations, Progynon-B, Progynon-DH, Proluton, Oreton and Neo-Iopax.

## THE COCA-COLA COMPANY, ATLANTA, GA. BOOTH 17.

The Coca-Cola Company is serving Coca-Cola complimentary to members attending the Session.

## JOHN WYETH &amp; BROTHER, 1118 WASHINGTON AVE., PHILADELPHIA. BOOTH 18.

All physicians are cordially invited to visit this booth where the following specialties will be on display: Amphojel, Wyeth's Alumina Gel for the treatment of hyperacidity and peptic ulcer; Kaomagma, Wyeth's Magma of Alumina and Kaolin for the treatment of diarrhea and colitis; Alulotion, Ammoniated Mercury with Kaolin for the treatment of impetigo contagiosa; Bepron, Wyeth's Beef Liver with Iron for the nutritional anemias; Mucare, for the treatment of constipation; Bewon Elixir, the palatable appetite stimulant and vehicle; Silver Picrate, for the convenient treatment of trichomonas vaginalis and acute anterior urethritis.

## A. S. ALOE COMPANY, 1813 OLIVE ST., ST. LOUIS. BOOTH 19.

## M. &amp; R. DIETETIC LABORATORIES, INC., 585 CLEVELAND AVE., COLUMBUS, OHIO. BOOTH 20.

Similac, a food for infants deprived of breast milk, will be exhibited. Representatives will be present to explain the merits of Similac in normal as well as difficult feeding cases.

## WESTINGHOUSE X-RAY COMPANY, INC., 410 PROFESSIONAL BLDG., KANSAS CITY, MO. BOOTH 21.



## COUNCILOR DISTRICT AND SOCIETY PROCEEDINGS

### COUNTY SOCIETY HONOR ROLL FOR 1940

(UNDER THIS HEAD WE LIST SOCIETIES WHICH HAVE  
PAID DUES FOR ALL THEIR MEMBERS)

#### HONOR ROLL

Chariton County Medical Society, December 5, 1939.

Perry County Medical Society, December 11, 1939.

Camden County Medical Society, December 18, 1939.

Miller County Medical Society, December 20, 1939.

Ste. Genevieve County Medical Society, December 22, 1939.

Clinton County Medical Society, December 23, 1939.

ASSOCIATE EDITORS: COUNCILORS OF THE  
TEN COUNCILOR DISTRICTS

#### FIRST COUNCILOR DISTRICT

A. S. BRISTOW, PRINCETON, COUNCILOR

Nodaway-Atchison-Gentry-Worth Counties  
Medical Society

The Nodaway-Atchison-Gentry-Worth Counties Medical Society met at the Linville Hotel, Maryville, on March 4 for a dinner meeting. Members present were Drs. F. R. Anthony, Charles T. Bell, J. A. Bloomer, Leslie E. Dean, Loren E. Egley, W. R. Galeota, W. R. Jackson, Robert C. Person and William M. Wallis, Jr., Maryville; Henry F. Bauman, Fairfax; C. E. Benham, John M. Davis, Charles H. Flynn, Claude D. Haskell and Clifton M. Waugh, Tarkio; Joe M. Boyles, Conception Junction; B. F. Byland, Burlington Junction; Eugene Crowson, Pickering; Charles D. Humbert, Barnard; Charles W. Kirk, Hopkins; P. J. Ross, Grant City, and Emmett B. Settle, Rock Port. Guests present were Drs. Oscar H. Damson, Bethany; L. E. Eckles, Topeka, Kansas; Jacob Kulowski, Irwin I. Rosenthal and Floyd H. Spencer, St. Joseph; L. F. Weyerick, Cameron; W. Logan Wood, Bolckow; and Ed Miller, Jesse Miller and H. L. Stinson, dentists, Maryville.

Drs. Charles H. Flynn and William R. Galeota were appointed a committee on public policy.

It was announced that the scientific program for the meeting of April 1 would be presented by Dr. Peter T. Bohan, Kansas City. The meeting will be held at the Linville Hotel, Maryville, at 6:30 p. m.

Dr. L. E. Eckles, pediatrician to Christ's of St. Francis Hospital, Topeka, Kansas, and formerly instructor in medicine at Harvard Medical School, gave a scholarly clinical paper on "The Prophylaxis, Diagnosis and Treatment of Contagious Diseases." The lecture was conservative and practical and was well received by the audience. It was illustrated by lantern slides. Discussion was by Drs. Haskell, Fynn, Waugh, Wallis, Egley, Byland, Settle, Weyerick, Kulowski, Bloomer and Davis.

By invitation, Dr. L. F. Weyerick, Medical Officer in Charge, District 11, Missouri State Board of Health, discussed the State Board's program of pneumonia control. Dr. Weyerick was invited to leave the Neufeld typing outfit and a supply of state furnished sulfapyridine at the clinical laboratory at St. Francis Hospital, Maryville, as a designated substation.

CHARLES D. HUMBERD, M.D., Secretary.

#### FIFTH COUNCILOR DISTRICT

W. A. BLOOM, FAYETTE, COUNCILOR

Boone County Medical Society

The Boone County Medical Society met in McAlester Hall, Columbia, at 7:45 p. m., February 6.

Dr. M. Pinson Neal reported for the committee on lay projects, lay organizations and lay education, on the prenatal blood test bill, stating that it was the opinion of the committee that since Boone County Medical Society had a member on the State Association Committee whose function was to consider such legislation the Society need not take any action. The report was accepted.

The application for membership of Dr. L. S. Highsmith, Columbia, was referred to the Board of Censors.

The secretary read an invitation from the Missouri Tuberculosis Association for members to attend a dinner and discussion on "X-Ray Technic and Interpretation" to be held at the Tiger Hotel, Columbia, March 8.

The secretary read the invitation from the Randolph-Monroe County Medical Society to a dinner meeting at Moberly, February 13.

Dr. Howard Rusk, St. Louis, spoke on "Some Considerations of Allergy," in which he described an excellent piece of work on the use of potassium chloride in the treatment of chronic urticaria and various other chronic sensitizations. Discussion of the paper was by Drs. Hurley L. Motley, M. D. Overholser, M. E. Cooper and closed by Dr. Rusk.

#### Meeting of March 5

The Society met at the Boone County Hospital at 7:45 p. m. with the president, Dr. F. E. Dexheimer, presiding.

Dr. L. S. Highsmith, Columbia, was elected a member.

A committee on cancer was appointed with Dr. M. Pinson Neal, Columbia, chairman, and Drs. Dudley S. Conley and Dudley A. Robnett, members.

Dr. Dudley S. Conley called attention to the work being done by the National Physicians' Committee in its campaign against adverse medical legislation and its efforts to defend unjust suits against the American Medical Association and constituents and moved that the Society send \$25 to the organization with the enthusiastic endorsement of its work. The motion was seconded and carried.

Dr. W. A. Bloom, Fayette, Councilor, called attention to the meeting of officers of constituent societies to be held in Jefferson City, March 10, and urged the officers to attend. He also announced the meeting of the Fifth Councilor District at Fayette on March 13 and invited all members to attend.

Dr. Claude J. Hunt, Kansas City, spoke on "Thyroid Diseases." He discussed the symptoms, diagnosis and treatment, paying particular attention to borderline cases and those presenting atypical symptomatology.

M. E. COOPER, M.D., Secretary.

#### Cole County Medical Society

The Cole County Medical Society met on December 4 at the Country Club, Jefferson City.

Dr. W. W. Bauer, Chicago, Director of the Bureau of Health and Public Instruction of the American Medical Association, addressed the Society and guests from adjoining counties.

In the afternoon Dr. Bauer addressed a large audience of women under the auspices of the Woman's Auxiliary.

#### Meeting of December 12

The annual meeting of the Cole County Medical Society was held in Jefferson City on December 12.

The following officers were elected: President, Dr. Irl Brown Krause; vice president, Dr. H. S. Stauffer; secretary-treasurer, Dr. James A. Hill; delegate, Dr. Thomas J. Kelly; alternate, Dr. Hugh W. Maxey; member of censor committee, Dr. E. E. Mansur.

#### Meeting of February 21

The Cole County Medical Society met at the Country Club, Jefferson City, February 21, for a dinner meeting.

Dr. W. T. Coughlin, St. Louis, presented a lecture on "Burns and Their Consequences."

JAMES A. HILL, M.D., Secretary.

#### Randolph-Monroe County Medical Society

The Randolph-Monroe County Medical Society met March 12 in the club room of Hart's Cafe, Moberly, for a turkey dinner at 7:00 p. m.

Three representatives from the Farm Security Administration outlined the government plan for the medical care of their clients. After questions and discussion it was decided to adopt the plan for one year beginning with the date the organization is completed. It was decided that the plan should include all regular physicians of the two counties regardless of whether they belong to the Society or not.

Dr. W. T. Coughlin, St. Louis, talked on "Cancer of the Breast and Its Removal," demonstrated by lantern slides.

Dr. O. P. J. Falk, St. Louis, discussed "Treatment of Hypertension and Its Complications," illustrated by lantern slides.

A round table discussion followed the talks.

Members present were Drs. M. C. McMurtry, F. A. Barnett, J. F. Flynt, Paris; R. A. Woods, Clark; Philip V. Dreyer, Huntsville; R. D. Streeter, T. S. Fleming, J. A. Costrino, W. R. Langston, H. C. Griffiths, M. P. Hunter, C. C. Smith, L. E. Huber and F. L. McCormick, Moberly. Guests were Drs. W. T. Coughlin and O. P. J. Falk, St. Louis; P. S. Kwiatoski, E. W. Shrader and O. O. Ash, Moberly; Mr. Frank C. Schille, Huntsville; Mr. J. E. Milam, Paris, and Mr. Wiley E. Downs, Columbia.

F. L. MCCORMICK, M.D., Secretary.

#### EIGHTH COUNCILOR DISTRICT

H. L. KERR, CRANE, COUNCILOR

#### Barry County Medical Society

The Barry County Medical Society met at the Barry County Hospital, Cassville, February 14, for its annual election of officers and to attend to other matters of importance.

The following officers were elected: President, Dr. Frank T. Kerr, Monett; vice president, Dr. Fred Hargrove, Monett; secretary-treasurer, Dr. George W. Newman, Cassville, reelected; delegate, Dr. George W. Newman, Cassville; alternate, Dr. Frank T. Kerr, Monett.

Miss Dorothy Vannerman, county health nurse, presented a report on the present health conditions throughout the county and enumerated the various phases of work being done.

The Society adopted a resolution for cooperation with the Farm Security Administration's medical cooperative plan to care for the sick and afflicted, which is limited to their clients.

GEORGE W. NEWMAN, M.D., Secretary.

#### TENTH COUNCILOR DISTRICT

E. J. NIENSTEDT, SIKESTON, COUNCILOR

#### St. Francois-Iron-Madison-Washington-Reynolds County Medical Society

The St. Francois-Iron-Madison-Washington-Reynolds County Medical Society met at the St. Francois County Courthouse, Farmington, March 1.

A letter was read from the American Medical Association Bureau of Medical Economics regarding information concerning "Group Practice," within the five county society. It was stated no such practice of group medicine exists in the immediate jurisdiction.

Dr. W. H. Barron, Fredericktown, read a letter concerning the proposed medical care for members of the Farm Security Administration in Madison County. He stated it had been rejected by the Madison County members. It in turn was rejected by the Society and it was agreed that attention of the State Association be called to this plan and information requested concerning the feasibility of such plans.

Drs. W. H. Barron and Reuben Appleberry were appointed members of the public policy committee and with Dr. N. W. Hawkins, Bonne Terre, were delegated to attend the meeting of presidents and secretaries and members of public policy committees in Jefferson City March 10.

Dr. O. P. J. Falk, St. Louis, gave an interesting discussion on "The Use and Abuse of Sulfanilamide: Discussion of Derivatives." Many questions were asked and an interesting discussion followed.

G. TIVIS GRAVES, M.D., Secretary.

#### Perry County Medical Society

The Perry County Medical Society met at the office of the president, Dr. B. T. Koon, Perryville, at 8 p. m. February 16.

The secretary reported on the resolution presented to the Perryville School Board in regard to proper medical care for the Perryville High School athletic department.

The medical care plan for Farm Administration Families in Perry County was discussed and it was decided to table the matter until a later date when all regular physicians of Perry County would be invited.

It was moved and passed to endorse the proposed Prenatal Blood Test Bill to be presented at the next state legislature.

In response to a letter from the Missouri State Medical Association, Drs. J. J. Bredall, B. T. Koon and G. A. Blaylock, Perryville, were appointed a committee on cancer. A list of the committee and a letter expressing the intent to cooperate with the court in the cancer problem was sent to the County Court of Perry County.

A letter was read from the Association calling attention to the fact that Eli Lilly and Company has advertised in THE JOURNAL for seventeen consecutive years. The secretary was instructed to write a letter of appreciation for the company's support of THE JOURNAL.

The following officers were elected: President, Dr. O. A. Carron; secretary, Dr. J. J. Bredall; delegate, Dr. G. A. Blaylock; alternate, Dr. B. T. Koon.

J. J. BREDALL, M.D., Secretary.

The current fad of drinking milk beverages at "milk bars" seems to be accomplishing an end sought for years by public health workers and nutritionists who have been recommending the drinking of more milk, Marion Dartnell, Ph.D., Chicago, says in the March issue of *Hygeia, The Health Magazine*.



# THE JOURNAL

OF THE

## Missouri State Medical Association

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### CANCER OF THE UTERUS

EARLY DIAGNOSIS AND TREATMENT

G. D. ROYSTON, M.D.

ST. LOUIS

Cancer is a malignant disease characterized by a disorderly growth of cells in the body. At first it is small and entirely local, but cancer cells usually multiply faster than normal cells and tend to invade surrounding tissues. Next to heart disease, cancer is the most frequent cause of death in the United States registration area. Cancer causes 4 per cent of all gynecologic pathologic conditions and 30 per cent of all deaths from gynecologic disease, most commonly due to cancer of the cervix and corpus uteri. In women over 40, one out of every eight dies of cancer according to recent mortality statistics. This may be due to a greater number of women living to the cancer age, to better diagnosis or to better registration, yet there seems to be an apparently increased incidence of the disease.

Cancer almost never develops in healthy tissues. A process severe enough to destroy the cervical epithelium is usually a safeguard against malignancy, while the chief danger is in irritation short of destruction. Practically all cervical cancers occur in obstetric injuries or in patients with pre-existing cervical disease. Graves felt that approximately one sixth of the life cycle of the individual (ten to twelve years in humans) is required for the development of cancer.

Cancer arises in cells that are in a state of proliferation. This proliferation begins and continues for some time in benign form, i.e., chronic inflammatory tissue changes of epithelial type. Continued irritation of a mild nature or chronic infection of a low degree act on this tissue and produce the changes in the cells characteristic of malignancy.

The tissue changes are (1) hyperplasia with atypia (loss of normal layers, irregularities in size and shape and changes in the staining properties of the cells), or anaplasia (reversion of cells to a more primitive form), (2) heterotopia (abnormal

location), and (3) round cell infiltration. The presence of all of these changes means cancer.

Early cancer is present when the epithelial cells are atypic and have lost differentiation to normal adult cells. Atypia means (1) blurring of the cell mass due to loss of normal architecture, (2) an intact basement membrane, (3) an abnormal behavior in staining qualities, (4) an irregularity in shape and size of cells and nuclei, (5) a loss of cell polarity, (6) an increase in the number of mitoses (indirect nuclear or cell division), (7) sharp demarcation of the blurred cell mass from normal cells, (8) an acute inflammatory exudate beneath the basement membrane and in contact with the new epithelium. Atypic changes present the earliest histologic evidences of cancer in humans. It is the moment of change from benign to malignant condition.

Since some time is necessary for the development of these changes, prevention of cancer during this state of proliferation is vitally important.

Prevention of cancer requires: (1) Regular periodic pelvic examinations should be made every six months in all women past 30 and after each labor, abortion and infection. All injuries should be repaired in a good light at the time of delivery and all infections cleared up before discharging the patient. (2) All predisposing factors should be recognized early and corrected: (a) In cervicitis the normal vaginal flora should be restored by replacement therapy. Use 20 per cent boric acid and 80 per cent beta lactose in a No. 11 veterinarian capsule in the vagina at bedtime as often as there is enough discharge to dissolve the capsules, continued for several weeks. Persisting cervicitis, or chronic cystic cervicitis, should be treated by cauterization and conization or the chronically infected tissue extirpated by the Sturmdorf or Schroeder operation. (b) Lacerations should be repaired early. Small recent tears usually heal under replacement therapy. (c) Cervical strictures should be dilated. (d) All suspicious areas (indurated, vascular or friable) should have a biopsy (microscopic examination of an excised piece of tissue). (3) Do a diagnostic curettage in all cases of abnormal

mal bleeding, especially bleeding between periods. Place all tissue in 10 per cent formalin (not in alcohol) and send to a competent pathologist for examination. (4) Consider every postmenopausal uterine bleeding as cancer until definitely disproved. (5) Stroke the cervical canal gently with a probe to cause free bleeding (Chrobak-Clark test) for cancer that otherwise may be hidden and overlooked. (6) Colposcopic examination should be made through a binocular colposcope which magnifies the cervix from three to thirty times. (7) Do the Schiller test which consists in flooding the untouched cervix (before any vaginal manipulation) with Lugol's solution (1 per cent iodine and 10 per cent potassium iodide in distilled water). Normal squamous epithelium contains glycogen which is stained a deep mahogany brown with iodine. Abnormal squamous epithelium lacks glycogen and does not stain well. Defective staining may be due to cancer, erosion, loss of surface epithelium due to trauma, ectropion or eversion of the cervical canal, syphilitic and tuberculous ulcerations and leukoplakia. The presence of such stainless areas calls for the excision of a section for microscopic examination and diagnosis. (8) Make an immediate diagnosis, or at once have the patient see a consultant who is skilled in such work. You must rule cancer in or rule it out. Procrastination is the greatest friend of cancer. (9) Remove all tissue chronically changed for this almost invariably precedes malignant changes. The predisposing factor of any cancer is long continued irritation.

Cancer is best prevented by regular periodic examinations every six months and the correction of all predisposing factors as cervicitis, cervical laceration, interference with cervical drainage by strictures, fibroids and other tumors. Cervical repair that removes all infected areas contained in the laceration is more important than the repair of the laceration itself. The latter reshapes the cervix but does not remove all abnormal cells. Only too often the symptomless fibroid is removed and the more dangerous chronic cystic cervix is left. A tumor must grow to some extent before it causes symptoms. This period is called the "silent stage," when the best chance for cure exists if recognized and properly treated. The presence of symptoms of cancer usually means an advanced case and the majority of such patients cannot be cured.

Clinically there are three phases: (1) proliferation characterized by hardness and induration but not by loss of tissue; (2) infiltration characterized by moderate tissue destruction; (3) ulceration and excavation characterized by extensive destruction of superficial structures, absorption and sepsis. Friability, always important, is destroyed by necrotic tissue. Vascularity usually is marked, particularly so if trauma is present to any degree. Careful attention to chronic proliferation lesions and early diagnosis of the symptomless "silent stage" of cancer will enable the control of this dread disease.

Statistics seem to demonstrate (1) the relation

of chronic cervicitis to cancer; (2) the necessity of treating and arresting chronic cervicitis whether or not it causes symptoms; (3) a chronic cervicitis can be found only by insisting on complete physical examination of the patient at her first visit to the physician's office, which examination should include an inspection and bimanual palpation of the genital organs in the deflorated woman and, if symptoms such as leukorrhea and irregular bleeding exist, also in the nondeflorated patient; (4) should doubt exist in the mind of the examining physician concerning the findings, consultation with a specialist trained in malignant disease should be had; (5) all tissues removed during any operation and certainly from the cervix and uterine body should be subjected to serial sectioning and careful microscopic examination of each section to rule out, or in, cancer since about 30 per cent of beginning cancer cannot be diagnosed clinically; (6) such a system would give the physician control of cancer. If such a system could be enforced in all women cancer would become a negligible cause of death among them.

Ninety-three per cent of all cancers of the female generative tract affect the uterus. Cancer affects the cervix eight times as often as the corpus uteri. Cancer of the endocervical canal is less frequent than of the uterine body and cervix although it is more treacherous.

Vulval cancer comprises about 5 per cent of pelvic cancers and usually affects elderly women from 60 to 70 years of age. It most commonly arises from leukoplakic vulvitis which calls for vulvectomy as prophylaxis. Lack of time causes me to limit this presentation to uterine cancer.

There are four modes of extension of cervical cancer: (1) continuity of tissue, (2) lymphatics, (3) blood stream, (4) direct implantation (only by manipulation or operation). The earliest extension is microscopic in extent and cannot be determined by the gross appearance. The bladder is involved earlier in cancer of the cervix and the rectum in cancer of the corpus uteri. Ureteral compression hydronephrosis and uremia are common terminal phases.

Cancer of the cervix is outlined according to the stage classification by Schmitz as follows:

#### STAGE 1

1. Nodule, invasive if below the surface, or everted if above the surface.
2. Chrobak-Clark sign (active bleeding on gentle probing).
3. Uterus is normally movable.
4. Leukorrhea.
5. Clearly localized growth (no invasion, destruction or metastases).
6. No symptoms in less than 10 per cent of all cancers seen by the physician.
7. Diagnosis is made by biopsy (microscopic examination of excised tissue).
8. Treatment: wide and complete radical removal or adequate radiation.



## STAGE 2

1. Ulcer or papilloma.
2. Indurated borders or raised proliferating excrescences.
3. Contact bleeding and discharge, often blood tinged mucous discharge.
4. Uterus may show mobility restricted.
5. Doubtfully localized.
6. Diagnosis confirmed by biopsy.
7. Treatment: adequate radiation.

## STAGE 3

1. Infiltrating or cauliflower growth with early necrosis and slough.
2. Tissue has brainlike consistency, indurated walls, and nodular surfaces are vascular and friable.
3. Extension to paracervical or parametrial tissue.
4. Leukorrheal discharge, blood streaked discharge, and hemorrhage (at first menorrhagia, soon metrorrhagia).
5. Anemia often out of proportion to amount of blood lost.
6. Diagnosis by biopsy (friable tissue may be obtained by a sharp curet; other tissue excised with a margin of presumably normal tissue and raw edges cauterized).
7. Treatment: adequate radiation.

## STAGE 4

1. Crater usually, although crater sometimes may be present in other stages.
2. Sloughing of friable tissue, often with putrefaction, or foul odor and infection (usually with streptococci).
3. Indurated irregular walls.
4. Uterus fixed.
5. Metastases.
6. Metrorrhagia, discharge and pain varying with time of occurrence, character and invasion of neighboring organs.
7. Constitutional symptoms and accessory symptoms.
8. Fixation, from infection (early and gradually abates) or malignancy (later and persistent).
9. Diagnosis by signs, symptoms and biopsy.
10. Treatment: palliative (a) usually 1800 to 2400 mg. radium for bleeding, (b) roentgen ray or presacral sympathectomy for pain, (c) local cleanliness, (d) hygienic condition, food, sunlight and sedatives.

## CANCER OF THE UTERINE BODY (ADENOCARCINOMA)

Cancer of the uterine body occurs usually after the menopause. Long standing leukorrhea and pruritus vulvae are often present. Cancer of the uterine body spreads chiefly by direct extension and seed implantation. It grows through the uterine wall and affects the rectum, omentum and intestines. The tubes and ovaries are involved more

often from corpus uteri cancer than from the cervical cancer.

Predisposing factors are cervical stenosis and chronic endometritis, especially of the polypoid variety. Do a diagnostic curettage in every case of abnormal bleeding, especially metrorrhagia or after the menopause, and have all scrapings examined by a competent pathologist.

Symptoms are (a) discharge, often profuse, intermittent and putrid; (b) hemorrhage, at first menorrhagic, later metrorrhagic; (c) pain in back and down legs may be a late symptom.

Diagnosis is made from the microscopic findings and symptoms, especially the reappearance of menstruation and symptoms due to pyometra.

Treatment is wide and complete removal of uterus and adnexa, or adequate radiation, individualized according to microscopic appearance. Surgical removal in all operable cases should be preceded by radiation in the anaplastic types. Radiation alone should be used in inoperable patients.

The prognosis of cancer depends solely upon the early diagnosis. Sixty per cent are inoperable within six months after the onset of symptoms. The older the patient is, the better is the outlook; also the more nearly malignant tissue resembles normal tissue the better is the prognosis.

## OPERABILITY

1. Normal mobility (vulcellum traction brings cervix to introitus without discomfort).
2. Patent cervical canal (dilate to see there has been no retention).
3. Afebrility (no local or systemic infection). Check leukocyte and Schilling differential counts and sedimentation time.
4. Sterile uterine and vaginal secretions (inoculate 5 cc. of patient's blood, defibrinated, with cervical secretion and incubate four hours for growth of colonies).
5. Good surgical risk (check metabolic disturbances, anemia and state of all organs) and put in best possible condition before operation.

Radical operation means removal of the entire uterus, adnexa and adjacent connective tissues. It is indicated only in stage 1 cervical cancer and in cancer limited to the uterine body.

Adequate radiation means radium locally for from 3,000 to 5,000 mg. hours (1 mg. for one hour equals 1 mg. hour of radiation) following roentgen ray used distantly to at least two fields (anterior pubic and posterior sacral) about four to seven erythema doses applied uniformly throughout the pelvic cavity for three or four weeks. It is indicated in all stages of cervical cancer and is the only treatment indicated in stages 2, 3 and 4. It may be used in body cancer.

Palliative radiation is usually from 1,800 to 2,400 mg. radium, indicated to control bleeding in advanced cases and roentgen ray to control pain. It often may be combined with presacral sympathectomy.

Medical management includes the care of infection, toxemia and other symptoms, abundant nourishing food, sunlight, rest, local cleanliness and sedation.

#### CONTRAINDICATIONS TO RADIUM THERAPY

1. General emaciation, cachexia and toxemia due to the absorption of waste products (radiation almost invariably aggravates these states).
2. Anemia with a red cell count below 3,000,000, leukocytes below 3,000, and hemoglobin below 50 per cent. (Radiation may aggravate anemia to the danger point.) Preliminary transfusion usually obviates this danger.
3. Impaired nitrogen retention (radiation increases nitrogen retention, especially in advanced cases).
4. Invasion of urinary or rectal tract (because of danger of fistulae). (The skilled specialist may use radium in such conditions with good results.)
5. Presence of infection (aggravated by local manipulations with radium); may use roentgen ray until there is a rise in temperature.

#### CONCLUSIONS

The patient cannot be aware of the onset of pelvic cancer and the physician must discover it by requesting and insisting upon routine semiannual pelvic examinations of every female patient over 30 years of age, and especially after labor, abortion and infection. Chronic cervicitis and the bleeding uterus must be carefully studied and properly treated. Every suspicious or doubtful case should have a biopsy and all tissue removed should be sent with a history of the case, including site of removal, to a competent pathologist for diagnosis.

Beaumont Building.

#### SIMPLE METHOD RESTORES PROTHROMBIN IN ABSENCE OF SEVERE LIVER DAMAGE

A simple method of restoring prothrombin, the anti-hemorrhagic factor in blood, when there is no severe liver damage present, is reported by William DeW. Andrus, M.D., and Jere W. Lord, Jr., M.D., New York, in *The Journal of the American Medical Association* for April 6.

Liver damage has been found to interfere with the production of prothrombin. In the absence of damage to the liver the New York men gave patients with low prothrombin blood levels a synthetic compound, 2-methyl-1, 4-naphthoquinone, which has a marked vitamin K activity. This vitamin is antihemorrhagic.

In twenty-six of the twenty-eight patients to whom the authors gave the compound the prothrombin level rose as much as 48 per cent within from twenty-four to forty-eight hours after the substance, dissolved in corn oil, was injected by vein.

Some of the types of cases in which the substance was found effective were: obstructive jaundice due to stone, hemorrhagic disease of the newborn and cancer of the stomach and pancreas.

Drs. Andrus and Lord point out: "The effect of a single injection may be prolonged for as long as a week, unless adverse factors such as operations on the biliary tract or other liver damage supervene."

## UNDERWATER THERAPY IN CHRONIC ARTHRITIS

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It has been my fortune to have treated a large number of cases of chronic arthritis in a large tax supported hospital, over a period of several years. The institution was located at a well known spa and was equipped with virtually every known device for diagnosis and treatment, particularly physiotherapy and hydrotherapy facilities and the staff included consultants in all fields. Since the patients were not obliged to pay either for their hospitalization or for professional care, and since the staff was on the public payroll, it seems probable that the observations made on these cases were not influenced to any extent by financial considerations. If the patients so desired they could return to the hospital at any time, a privilege which was abused in a number of cases. No attempt was made to adopt a standard therapeutic regimen for these cases, each staff member being free to try his own ideas; which is testimony as to the difficulty existing in the management of this disease.

We were constantly confronted with difficulty in the classification of this disease and eventually came to the opinion that it did not make any particular difference whether a case was classified one way or the other; the therapeutic problem remained the same. The roentgenologist could not be relied upon for aid in classification for he not infrequently contradicted his own diagnosis, and patients seemed to change from one type to another in a few months or a few years. Since most any patient is likely to give a history of gonorrhea, either days or years ago, there seemed to be little use for this classification of the chronic cases. Moreover, regardless of the type of arthritis there was little to offer therapeutically, the principal consideration being whether the patient was febrile or not. Each case was given a complete examination on each admission, foci of infection removed and such other measures taken as were necessary to place the patient in the best possible general health. Particular attention was given to diet and to the mental condition of the patient.

We were impressed with the similarity of a chronic arthritic joint and a rusty hinge on a farmer's gate, so we attempted to manage the joint in the same manner as a rusty hinge would be managed, that is to oil it and then manipulate it until the maximum range of motion was restored. The oiling was considered analogous to the general therapeutic measures. Quite like the hinge the joint that most needed exercise was least likely to receive it due to the resultant discomfort or to the actual inability of the patient to effect the motion. With this situation in mind it was decided to treat the arthritic patients by the same method that was being used for the poliomyelitis cases. Patients



were taken to a specially constructed swimming pool each day where underwater exercises were given under the guidance and assistance of a physiotherapist. Some of the patients were so deformed that it was necessary to lower them into the water with a traveling hoist devise. A table was placed under water on which passive exercises could be carried out by the therapist for those who were unable to exercise unassisted. Even the most painful joints generally could be manipulated without pain when the gravitational effect was eliminated. Patients who were able often devised their own exercises.

The water in the pool was maintained at a temperature of from 90 to 96 F. which not only was comfortable to the patient but also helped considerably to relax the muscles associated with the involved joints, thus further facilitating motion and also reducing pain. Heat is the time honored aid in the treatment of sore joints, and what better way can be found to supply moist heat to a joint than by immersing it in the pool. Muscles that have been weakened and atrophied either as part of the arthritic process or from disuse are protected and also benefited by the stimulating and massaging action of the warm water. When the patient is assured that no pain will result from action of a joint (due to the effective removal of gravity) he is prompted to indulge in active motion with benefit to the attached muscle groups as well as to the joint. Patients with badly involved knees, ankles and hips, who otherwise are unable to be out of the wheel chair, in many cases are able to walk in the pool with marked improvement to both muscles and joints. Furthermore the patient has a sense of security against falling and against pain which causes him to put forth much more effort and to be much more bold than is the case when gravity is not eliminated.

Perhaps of even greater benefit than that derived from the joint exercise is the benefit to the morale by this method. Patients who have spent many months in institutions or as invalids at home know but few pleasures and are prone to develop an invalid complex which thwarts the physician in his treatment from the old familiar angles. Patients center their entire day on the afternoon dip which is refreshing and pleasant and during which they can notice improvement. Also since it is possible and economically wise to treat several patients in the pool simultaneously a society between patients similarly affected is developed which results in more or less unconscious competition and stimulation of confidence. Even the appetite is benefited by the tonic effect of splashing about in the water. Certainly it was significant that the patients never objected to their pool treatments nor tried to avoid them as sometimes happened when gymnasium treatments were being used.

Inasmuch as it was never thought to be justifiable

to treat a patient by the pool method alone, nor is it at all possible to estimate the relative value of spa treatment, of improved diet, of a general change from the home environment, of climate and of the host of other factors involved in this series of institutionalized cases, yet there was no doubt but that the patients who were sent regularly to the pool made better progress than those who did not receive this treatment. While we recognize the general custom and the obvious necessity of reporting a series of cases in statistical manner, I have deviated from that usage for the reason that improvement in arthritis is prone to be both temporary, imaginary and relative. No criterion is available for rating the cases since one physician might rate a case as cured or greatly improved whereas another physician would rate the case as only slightly improved. If the patient's opinion is to be the basis of rating the case an even wider and less reliable report can be given. However, we do feel that we can say with safety that of the gross admissions of chronic arthritic patients fully 50 per cent left the hospital after an average stay of forty-five days with what both the patient and physician considered worth while improvement. Of those who were given the hydrotherapeutic pool treatments at least 75 per cent left with a like degree of recovery.

#### CONCLUSIONS

1. I believe the hydrotherapeutic pool is of greater benefit in the treatment of chronic arthritis than any other form of physiotherapy, and that definite improvement results in a large number of cases in which it is utilized.

2. In several hundred cases so treated not a single accident or injury to a patient resulted.

925 Argyle Building.

#### COURT OF APPEALS RULES AGAINST BRINKLEY

"Last week the United States Fifth Circuit Court of Appeals at New Orleans upheld a federal district court decision in the libel suit brought by John R. Brinkley against the editor of *Hygeia*," *The Journal of the American Medical Association* for March 9 says. "The statement of the court in making this decision was as follows:

"We are spared the necessity of discussing the assignments of error in this decision and of reviewing the evidence. It is sufficient to say that the evidence of the plaintiff, placed on the stand by the defendant, tends to show the truth of the statements of fact complained of, and we find no substantial evidence tending to show the defendant was actuated by malice or that plaintiff suffered any actual damage compensable in money."

"In the presentation of its case before the federal district court the American Medical Association revealed a long trail of dubious medical activities on the part of Dr. John R. Brinkley for which there was no refutation. In the meantime he continues to broadcast from his station across the Rio Grande, and the United States Post Office continues to permit him the use of the United States mails."

## FRACTURES OF THE VERTEBRAE DURING METRAZOL THERAPY

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AND

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The psychological effects of convulsion therapy in the treatment of various types of psychoses have been evaluated in a number of papers recently and will not be discussed here. In this paper we shall report six cases in which this treatment was administered and was complicated by fractures of the spine. We believe that this lesion is probably the most frequent complication of convulsion therapy and that these fractures are usually not recognized because most of them are relatively mild compression fractures which cause no visible deformity and may cause relatively mild symptoms.

In November 1938 Stalker<sup>1</sup> reported a double compression fracture of the spine following the second injection of triazol in a patient with paranoid schizophrenia. He stated that this patient was an unusually muscular man and, apart from dislocations of the jaw, this was the only injury encountered in fifty patients so treated. Hamsa and Bennett<sup>2</sup> reported two patients with fractures of the spine in a series of 800 convulsion shock therapy treatments. Bennett and Fitzpatrick,<sup>3</sup> on the other hand, noted eight patients with compression fractures of the thoracic spine in a series of seventeen patients treated with metrazol. This is an incidence of 47 per cent. It is thus evident that there is a wide discrepancy between the 47 per cent of fractures of the spine reported by Bennett and Fitzpatrick and the experience of other observers. Our six cases of fractures of the spine occurred in a small series of twenty patients in whom convulsions were induced by injections of metrazol.

### REPORT OF CASES

Case 1. White female, aged 30, with acute mania received ten convulsive injections. Following the fourth injection she complained of pain in the back which persisted. Since this patient was treated in October and November of 1938, the pain in the back was thought to be muscular in origin and the spine was not subjected to a roentgenographic examination nor was any specific treatment of the back instituted. A follow-up roentgenogram in March 1939 indicated that the fifth, sixth and seventh thoracic vertebrae had suffered mild compression fractures and at that time the bodies of these vertebrae showed hypertrophic changes and there was some narrowing of the intervertebral disks in this region.

Case 2. White female, aged 26, with manic depressive psychosis was given seven metrazol injections in December 1938. She had relatively slight pain in the back immediately after the convulsions but in February complained of more pain in the thoracic region of the back.

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Presented at the St. Louis Medical Society, September 26, 1939.



Fig. 1. Lateral view of spine in case 2. Note the narrowing of the body of the sixth thoracic spine and the loss of contour of its superior surface.

Physical examination showed moderate tenderness on pressure over the spinous processes of the fifth and sixth thoracic vertebrae and a lateral roentgenogram of this region showed slight decrease in diameter of the sixth thoracic vertebra with irregularity of the cortical line of its superior surface (fig. 1).

Case 3. White female, aged 32, with mild manic depressive psychosis was given seven metrazol treatments in January 1939. She made no complaint of her back but exhibited slight tenderness on pressure over the spinous processes of the third and fourth thoracic vertebrae and a follow-up roentgenogram showed small fragments broken from the opposed anterior margins of the bodies of the third, fourth, sixth and seventh thoracic vertebrae. There was no definite compression (fig. 2).

Case 4. White female, aged 23, with schizophrenia was given eight metrazol injections in December 1938. Following the first convulsion she complained of severe pain in the back in the dorsal region. This was thought to be muscular in character and was discounted and the metrazol treatment was continued. Following each convulsion treatment the patient complained bitterly of backache and stated that at times it was reflected around the chest wall into the precordial area. In January she resumed her occupation but continued to complain of pain in the back and around the chest. In February 1939 roentgenograms showed mild compression fractures of the fourth, fifth, sixth and seventh thoracic vertebrae (fig. 3). This patient was fitted with a high back brace which she wore for about three months and has made an uneventful recovery from the fractures of the spine.

Case 5. A woman, aged 26, with anxiety neurosis was given nine metrazol treatments in February 1939. At no time did she complain of symptoms in her back but roentgenograms made in April 1939 showed a small chip





Fig. 2. Lateral view of thoracic spine in case 3. Note the evidence of minor compression fractures of the adjacent anterior margins of the third, fourth, sixth and seventh thoracic vertebrae. Also, there is considerable evidence that the intervertebral disks have been forced into the bodies of the vertebrae.



Fig. 3. Lateral view of the thoracic spine of case 4. Note the compression of the bodies of the fourth, fifth, sixth and seventh thoracic vertebrae and also the protrusion of the intervertebral disks into the bodies of several of the vertebrae.

fracture of the superior portion of the anterior margin of the sixth thoracic vertebra.

Case 6. A man, aged 30, with hebephrenic schizophrenia was given four metrazol treatments in August 1939. His first treatment was at 9:30 a. m. when 3.5 cc. of metrazol were injected intravenously. In twenty-two seconds the patient went into a convulsion, fourteen seconds of which was tonic in form and twenty-five seconds clonic in character. The total convulsion lasted thirty-nine seconds. At 9:45 the patient regained consciousness but was confused. At 10:15 he complained of nausea and began to vomit; then he suffered severe pain in the region of the heart. He became cold, clammy, perspired profusely for about thirty minutes and exhibited a slight cyanosis of the finger nails. The pulse rate was 84 per minute and the blood pressure was normal. The following morning he complained of generalized aching pains. Following each of the subsequent treatments he complained of stiffness of the back and pain in the precordium and a roentgen ray examination after the fourth treatment revealed compression fractures of the seventh and eighth thoracic vertebrae. The metrazol treatment was discontinued and the patient was given a high back brace which he is still wearing.

These fractures were caused by the violent contractions of the muscles of the back and differ from the typical traumatic fractures of the spine both in location and type. The usual traumatic fracture of the spine is produced by a crushing force from above or by a fall in which the victim lands with the spine in a more or less vertical position and the

spine is hyperflexed or folded like a jackknife. In these traumatic injuries the fracture tends to occur at the point of greatest flexion, that is, in the lower thoracic or the lumbar region. In the fractures which may occur during a convulsion induced by metrazol the lesions tend to occur in the middle portion of the thoracic spine, a region where traumatic fractures are relatively uncommon.

Consequently, it is believed that these fractures are produced by a severe longitudinal compression of the spine while the patient is in a position of opisthotonos and that the spine breaks in the midthoracic region because the normal dorsal curve of the thoracic spine is maintained during opisthotonos and the midthoracic region is the area of greatest curvature. Thus, with severe longitudinal compression we would expect the break to occur in this region.

In the traumatic fractures of the spine caused by hyperflexion, the anterior portion of the bodies of the injured vertebrae are more severely injured than are the posterior portions and the vertebral bodies tend to become wedge-shaped and there is a tendency toward the development of a kyphosis in the region of the fracture. In the convulsive fractures there is much less tendency to wedging of the bodies of the vertebrae and the entire body may be compressed or shortened in its vertical

diameter. It is also characteristic of these fractures that the intervertebral disks may be driven into the vertebral bodies, not as local protrusions of the nucleus such as occur in Schmorl's nodes but apparently by a giving away of the entire bony plate comprising the adjacent surface of the vertebral body. The picture resembles that of the biconcave vertebral bodies seen in severe osteoporosis, but the deformity is much less marked.

Because the normal dorsal curve of the thoracic spine is maintained even during opisthotonos, the anterior margins of the vertebral bodies suffer slightly more than do the posterior margins and there may be slight wedging of the fractured vertebral bodies with crumpling of the anterior margin, or small fragments may be broken off from the anterior margin of either the superior or the inferior portion of the body.

All of our patients who suffered fractures of the spine from convulsive therapy were of the asthenic type, that is, they were tall slender individuals in whom the bodies of the vertebrae are relatively narrow; and it is to be expected that the bodies of such vertebrae would not withstand as much longitudinal compression as would the broad, relatively short vertebra of the so-called herbivorous type of patient.

The fractures were relatively mild in character and in none of them was there sufficient crushing of a vertebral body to warrant an attempt to correct the deformity by hyperextending the spine and immobilizing it in a position of hyperextension; nor was there sufficient disability in any of our patients to warrant keeping them off of their feet. As a matter of fact, in only two of our six patients were the symptoms sufficient to justify artificial support for the spine and these two were relieved by the application of a high back brace with shoulder straps. In these two patients the pains around the chest suggested nerve root irritation. There was no paralysis in any of our patients.

From our experience it is probable that fractures of the spine will occur in approximately one third of the patients who are subjected to convulsive therapy. The question naturally arises as to whether or not the probability that a fracture of the spine may be produced should be considered a serious contraindication for this treatment. We do not believe that it should prevent one from using convulsive therapy in selected patients. However, when this form of therapy is used the physician should use it with the knowledge that fractures of the spine not infrequently are caused by the treatment and the patient or the patient's family also should be warned of this fact. We do not believe that any form of splinting of the spine will effectively prevent these fractures because, as mentioned previously, the fractures are due to direct longitudinal pressure induced by the powerful contraction of the spinal muscles and the only form of splinting which would be efficient in counter-

acting this force would be direct traction, which would not be applicable during the convulsion.

The method of inducing spinal anesthesia by injection of 10 mgs. of pontocaine hydrochloride or of 100 mgs. of procaine hydrochloride into the spinal canal between the first and second lumbar vertebrae, as introduced by Hamsa and Bennett,<sup>2</sup> is worthy of consideration. This will certainly prevent the fractures of the femur, hip and pelvis which occasionally occur during the therapy, and it is probable that it will so ameliorate the pressure on the spine that it will also prevent fractures in this region. At the same time, they suggest holding the upper extremities to the side and thus tending to prevent the occasional fractures of the upper extremity. In schizophrenia Hamsa and Bennett induce hypoglycemic shock and at the onset of coma administer metrazol and immediately follow with the administration of hypertonic dextrose solution. With this method the tetanic spasm seemed less severe. We have not tried these methods but expect to do so as Hamsa and Bennett state that the repeated lumbar punctures necessary in the first method have not caused any ill effects.

In regard to treatment of the injury to the spine after it has occurred, the first consideration is: Should the presence of such an injury cause one to discontinue the convulsive therapy? That responsibility rests with the physician. It is probable that continuation of the treatment will add to the severity of the deformity. However, in the instances under our observation, particularly the multiple fractures in case 4, the eventual deformity was not sufficient to warrant attempt at correction or sufficient to warrant keeping the patient off her feet. On the other hand, we believe that, while in this instance the first fracture occurred at the fourth injection, it is probable that either the other fractures occurred later during convulsions or that the compression became accentuated during the treatment. In such instances we now believe that if subsequent convulsions are induced the patient should be given a spinal anesthetic or insulin shock should be induced before each treatment.

In the mild fractures with no neurological signs and practically no deformity and which cause relatively few symptoms, we do not believe that any specific treatment is necessary other than that the patient should restrict his activities and avoid attempts to do heavy lifting. In the slightly more severe fractures which were accompanied by nerve root pains we have fitted the patient with a high Taylor back brace with shoulder straps and this form of support has been found sufficient to permit the patient to continue ordinary occupations but not to engage in heavy manual labor. Should an instance occur in which there is marked compression of one or more vertebrae, either with or without paralysis, this fracture should be treated according to the now well recognized principle of correcting the deformity by hyperextension and maintain-



ing the hyperextension by means of a plaster jacket. In our experience with traumatic fractures without paralysis this hyperextension can usually be maintained while the patient is ambulant.

In the case of a growing individual, that is, an adolescent or a child, it is possible that marked deformities may occur as a result of subsequent growth because such deformities have been noted in children who have had tetanus and who had unrecognized and untreated fractures of the spine as a result of the tetanic convulsions.<sup>4</sup> Consequently, if convulsive therapy is given to children or to adolescents the spine should be examined

afterward and if a fracture has occurred prolonged support is indicated.

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#### BIBLIOGRAPHY

1. Stalker, H.: Double Vertebral Compression Fracture From Convulsion Therapy, *Lancet* 2:1172-1173 (November 19) 1938.
2. Hamsa, W. R., and Bennett, A. E.: Traumatic Complications of Convulsion Shock Therapy, *J. A. M. A.* 112:2244 (June 3) 1939.
3. Bennett, B. T., Jr., and Fitzpatrick, C. P.: Fractures of the Spine Complicating Metrazol Therapy, *J. A. M. A.* 112:2240 (June 3) 1939.
4. Dietrich, H. F.; Karshner, R. G., and Stewart, S. F.: Tetanus and Lesions of the Spine in Childhood. (Presented at the meeting of the Academy of Orthopaedic Surgeons in Memphis in January 1939.)

## SYMPOSIUM ON HEART DISEASE

### THE VALUE OF THE ELECTROCARDIOGRAM IN DIAGNOSIS

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The increasing use of the electrocardiographic examination, and the consideration of installing this service in many small hospitals in many communities warrants a discussion of the actual value of the electrocardiogram in diagnosis. Surgery, as well as medicine, has been invaded by the recording of the electrical response of the heart in the differential diagnosis of acute cardiac injury and acute abdominal emergencies requiring surgery, for differentiating spontaneous pneumothorax and traumatic injuries and wounds of the chest from cardiac pathology, and in the important consideration of the operability of the patient as determined by the cardiovascular state.

The electrocardiogram is now thirty-seven years old, Einthoven having made its application to clinical medicine possible by the development of the string galvanometer in 1903. It has evolved from the product of an experimental laboratory and a delicate, expensive, immovable instrument, to one of frequent clinical use at the bedside as a small transportable apparatus.

The use of the electrocardiogram by the general practitioner and the specialists in other lines than that of pure cardiology and internal medicine has brought the need for training a greater number of men in accurate interpretation. Short courses of instruction and diligent study permits correct reading of the vast majority of the tracings and ready consultation on the unusual ones may be had by rapid transportation of them to larger centers where considerable experience has been accumulated. There has been a commendable reticence of the general practitioner to assume undue responsibility without consultation. Part of this is due to the readily transportable nature of the electrocardiogram, consultation may be had with less ex-

pense, less loss of prestige and less chance of the loss of the patient than is usual to other consultation.

Cardiac conditions which otherwise might not be diagnosed or suspected are now so frequently seen in the electrocardiogram as to invite routine use as a part of a general examination. The first use was for the differentiation of cardiac arrhythmias, and no one can master bedside diagnoses of arrhythmia who does not also use the graphic methods. As pointed out by Sir Thomas Lewis, the entire question of the cardiac irregularities has been placed on a rational basis. The site of the impulse formation may not be known by any other method as the P wave signals the impulse in the sinus node, when the form and A-V interval are normal; the form is changed and interval decreased as in ectopic sites of impulse formation, frequently found the forerunner of fibrillation; and nodal rhythm and auricular flutter demonstrated with clinically normal ventricular contractions. The very form of the P wave or auricular contraction is of value in measuring the nutrition and metabolism of the heart. Auricular fibrillation, multiple extrasystoles, and partial heart block are diagnosed only with the aid of the electrocardiogram.

Acute coronary occlusion with the current of injury, R-T segment changes and T wave inversions, and the localization and evolution of lesions were next demonstrated and are now firmly written into clinical medicine.

The three chief uses of the electrocardiogram are of recent origin, being: (1) detection of myocardial disease, (2) recognition of obscure coronary disease, (3) estimation of digitalis effects.

A normal electrocardiogram is of great value in

ruling out heart disease in the presence of questionable symptoms and findings, while a distinctly abnormal electrocardiogram greatly increases the probability that the symptoms are due to myocardial disease. In suspected rheumatic fever and postfebrile infectious states the use of the electrical tracing is of value in general practice. The ability of the heart to stand hypertension is best estimated by the electrocardiogram when left ventricular strain is followed. The degree of right ventricular strain in mitral stenosis, congenital heart disease and silicosis is detected only with the electrocardiogram.

A positive diagnosis of minor coronary infarction frequently cannot be made without the aid of the electrocardiogram, and frequently the curves not only give the best means of observing progress but of permanently recording it. Such graphic information is most valuable to insurance companies.

There is no portion of general practice in which the electrocardiogram is of as much service as in the estimation and control of digitalis administration. To quote Dr. Frank Wilson, "No patient with cardiac failure and rapid ventricular rate should be given large doses of digitalis intravenously or intramuscularly until an electrocardiogram has been taken to make certain tachycardia is not the type made worse by digitalis." A-V dissociation with rapid ventricular rate or tachycardia with variable ventricular response are usually indicative of grave intoxication and fatal poisoning may be avoided by recognizing them.

In prognosis the tracings are of value in showing progressive changes and new lesions. As a rule large hearts in failure, showing poor electrical response, warrant a poor prognosis. T wave changes

without the current of injury sometimes give a first clue as to myxedema or lack of nutrition or vitamins. These conditions are corrected and a supposed cardiac cripple is returned to a useful state to the great credit of the general medical office.

The commonest mistakes made by the occasional user of the electrical tracing is to overvalue the changes of obesity and to undervalue the small posterior lesions which resemble gallbladder disease. Posterior lesions carry congestive failure of the liver even to the extent of producing large tender livers and slight jaundice. T wave changes of anemia and post-influenzal states are frequently mistaken for chronic coronary disease. These, together with records of anterior chest leads, usually warrant specialized consultation. The extent to which poorly nourished hearts fail in their electrical response after exercise is demonstrated by serial electrocardiograms showing transient T or R-T segment changes, a new but sensitive means of more accurate prognosis.

In summary, electrocardiography justifies its place in diagnosis because of its ease of use and accuracy, because of its long established value in the arrhythmias and definition of heart injury in differential diagnosis, the newer uses of estimation of myocardial damage and digitalization and in prognosis and measuring of functional response. This graphic method has given the clinician confidence in diagnosis, a means of exact prognosis and has rationalized his therapy. The principal deterrent remains the human factor of training sufficiently well a large number of physicians in its use.

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## SYPHILITIC CARDIOVASCULAR DISEASE

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Cardiovascular disease, due to syphilis, includes the heart, aorta, arteries, veins and capillaries. Syphilis is essentially a disease of the vascular system and has a predilection for attacking the largest and the smallest vessels. Therefore, the aorta from the aortic ring down to where it makes its first great division is the favorite site of syphilitic disease, usually in the form of aneurism. Simple aortitis is considered as being of the same pathological nature as an aneurism. That the smaller vessels are attacked is proved by the fact that cerebral accidents due to syphilis are one of the most common manifestations of that disease and have to do with the formation of gummata where small vessels supply an important part of the brain area. The cerebral manifestations may be due either to (a) ruptured blood vessels especially weakened by

syphilis, (b) gumma formation which closes off blood supply to an important part of the brain, or (c) endarteritis. Gumma formation has the better prognosis.

There is no doubt but that the aorta and the blood vessels are invaded during the early stages of syphilis, especially during the so-called secondary stage. In most instances the natural resistance of those parts throw off the organisms or kill them in situ. If it were not true that certain parts of the body have local immunity to the disease, all of the body would be equally attacked by syphilis and there would be cardiovascular syphilis, bone syphilis, syphilis of the liver and of the skin, all at the same time. Immunity is not able to throw off all the infection in the blood vessels so that from the time of the invasion of the blood vessels by the disease



in its early stages until middle age or old age is reached these organisms are often dormant in these places, causing gradual small changes which, in their accumulated injury, finally pass the critical line and produce signs and symptoms of cardiovascular syphilis.

In order to understand how this may take place, one should understand the pathology of syphilis. The pathological changes that occur in syphilis in every part of the body are divided into four stages. It must be understood that syphilis is not a disease that marches progressively through all four stages. It may pass through one stage and remain there all the rest of the patient's life, or it may pass through other stages; but in a complete syphilitic cycle pathological changes pass through all four stages in a longer or shorter time.

The first stage is that of invasion in which the specific organisms of syphilis implant themselves in the tissue and, if the immunity is not high enough, remain there, at first causing no pathological disturbance whatsoever except the invasion of a few leukocytes. They do not produce any damage until the second stage.

The second stage is that in which the immune forces of the body take note of the disease and begin to deposit cell units of the reticulo-endothelial system about the colonies of *Spirochaetae*; this infiltration consists of lymphocytes, plasmocytes and macrophages and is known as the stage of infiltration.

The third stage is that of resolution in which the infiltrative units begin to drift away and are replaced by young connective tissue cells.

The fourth stage, fibrosis, is that in which the young connective tissue becomes mature and begins to exert pressure leading to scar formation, or the formation of gumma if the process is rapid.

Syphilitic cardiovascular disease always should be regarded from the standpoint of the pathological stage in which it exists in the specific individual. It also must be remembered that when signs and symptoms of syphilitic cardiovascular disease appear, one is no longer dealing with an early involvement but with a late one and it may be that the therapeutic measures directed toward the control of this condition must have due regard for the pathological stage in which the disease is found. In the stages of invasion and infiltration the arsenicals and bismuth can be used, but when the disease has reached the stages of resolution and cicatrization the arsenicals must be used with great care. The question naturally arises "How can these stages be told?" The only successful treatment of cardiovascular disease is its prevention by the thorough treatment of the individual when his syphilis is in the early stage. Adequate treatment, which consists of at least thirty doses of neoarsphenamine, forty doses of bismuth and forty doses of mercury, used continuously over at least from sixty-four to seventy-two weeks of time, is the an-

swer to the question. This amount does not cure all early syphilis but if this treatment is carried out the great majority of those who otherwise would have cardiovascular disease do not develop it.

In order to detect early involvement of the cardiovascular system, the most successful method is the teleroentgenographic study of the chest of the syphilitic individual during stated periods of time. As an example, when early syphilis is adequately treated, a teleroentgenographic study of the chest should be made at the end of continuous treatment and probably every year thereafter. By this method asymptomatic signs of the disease can be discovered and treatment instituted, in which bismuth and the arsenicals are stressed, beginning with a short course of bismuth and switching to the arsenicals as soon as there is no danger of a Herxheimer reaction or cardiorecivation. Furthermore, such signs as pain in the chest upon exertion, shortness of breath, exhaustion in a young individual upon moderate exertion, are all to be taken into consideration with due regard to cardiovascular syphilis. Unfortunately, most of the cases of cardiovascular syphilis which are treated as such did not know that they had syphilis until they sought the services of a physician on account of some of the classical signs and symptoms of this disease. In other words, they had had their syphilis for a long time, unknowingly, and consequently already had a marked involvement of the aorta before it was discovered that they had syphilis. A great deal can be done for these patients but the therapeutic measures have a limit. When signs and symptoms of cardiovascular disease due to syphilis make their appearance, the patient already is suffering from advanced cardiovascular disease. It may be that it is still in the infiltrative or early cicatricial stage and, no matter how much the disease has progressed, there are still many live colonies of *Spirochaetae* in the middle coat of the vessels or around them. If the patient does not have decompensation, the treatment can start with sodium iodide and bismuth for about ten doses of each and then one can change to the arsenicals. If neoarsphenamine is used, 0.1 mgs. should be the initial dose and never more than 0.25 mgs. of neoarsphenamine should be given. Probably much better results can be secured in these cases by the employment of bismuth arsphenamine sulfonate, or bismarsen. The intramuscular injection of this combination of arsenic and bismuth does not seem to produce as much aortic disturbance as the intravenous use of arsphenamine. In this case the treatment can be started with .1 gram of this substance dissolved in 1 cc. of water, twice a week, and gradually raised to .2 gram, every five days, the course consisting of ten to twenty doses. If there is improvement in the patient's progress, courses of this treatment should be given over a long period of time, and the aorta constantly watched by the aid

of teleroentgenographic studies. In this way the life expectancy of such patients can be raised at least five years.

On the other hand, if one is dealing with an old fibrotic aorta, with or without decompensation, the main effort of the therapist should be directed toward conservation of energy of the heart and simply treat the heart as a decompensated one. These cases should be treated as any cardiac case and in no instance should antisymphilitic treatment of any kind be given. If any treatment is given, it should be sodium iodide by mouth and mer-

cury rubs, and if one has a good deal of courage, bismuth may be added as intramuscular injections.

As a final word, it is well to remember that the best treatment of cardiovascular disease is its prevention by the thorough treatment and observation of the patient in the early stages of syphilis. If the syphilis in the patient is not discovered until someone diagnoses cardiovascular disease, great damage has already been done and the greatest of therapeutic skill must be used in handling the case.

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## PERICARDITIS

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Pericarditis is a fairly common condition. It is found in from 5 to 10 per cent of all postmortem examinations and in about three-fourths in acute form.<sup>1</sup>

Acute pericarditis is the division of this disease in which there is most concern; hence I will devote the most of this discussion to it. However, later I will mention chronic constrictive pericarditis and congenital pericardial defects, the latter of which are rare.

Acute pericarditis may be divided into acute fibrinous or serofibrinous, purulent or hemorrhagic. The latter two forms are less common.

Acute infectious fibrinous pericarditis is most frequently caused by rheumatic fever, lobar pneumonia and tuberculosis. Influenza, tonsillitis and other obscure infections may be a cause.

There are three other types of fibrinous pericarditis which are not of any infectious nature: pericarditis due to cardiac infarct, coronary thrombosis in one of the coronary vessels or as a result of sclerotic damage to the myocardial blood supply; pericarditis as a result of uremia which is a terminal event in the process of nephritis; pericarditis due to the presence and reaction to a foreign body.

*Signs and Symptoms.*—Acute pericardial disease is usually painless. There may be moderate or high temperature, usually a rapid pulse, breathlessness and the patient is often restless. The most important symptoms, however, appear after there has been a moderate or large effusion. Many times it is an entirely obscure disease previous to the formation of the effusion; however, as this forms it gives rise to many symptoms. As the area of cardiac dullness increases, the heart tones become distant and diffuse, the apex beat may be displaced and difficult to locate. On inspection of the chest, a wavy motion is sometimes noticed over the cardiac area at each cardiac impulse.

The pressure symptoms are of two sorts: those due to compression of the heart which causes insufficient blood to enter the heart and lungs pro-

ducing dyspnea with faintness and venous congestion; those due to engorgement of the greater vessels which causes dyspnea with cough and hepatic engorgement.

An important sign which often is found in some stage of the disease is a friction rub which appears in a large number of cases although in some instances for only a few hours. In others, it will be prolonged over a period of days. In some cases it thus may escape the attention of the attending physician. The friction rub has been described as a superficial, leathery or scratchy friction rub.<sup>2</sup> It may not be synchronous with the heart sounds. I am of the opinion that the friction rub will vary greatly with different types of infection and observers. If present, it can be heard anywhere over the precordium and sometimes is heard in the back and the neck, but is more easily heard along the left external surface of the chest. It is usually rough and grating and sounds near the ear. It may be heard both in systole and diastole. After the effusion develops, its character may change or finally disappear.

Roentgen ray will give many clues in the diagnosis of this condition if persistently carried out and the findings carefully checked. Orthodiagraphy particularly will give a great deal of help since by this method one is able to measure the exact surface area of the heart. This can be checked accurately with reasonable surety that the size or area of the heart in a series of consecutive examinations has not been distorted. An important finding in a roentgenogram is a bulging of the lower corners of the heart shadow. As the fluid gathers, it tends to fill the hollows and curves of the heart shadow and greater vessels. It eventually obscures and abolishes most of the cardiac landmarks. The physical findings along with these are the increased area of the cardiac dullness and, as the enlargement increases, the heart assumes a conical shape. This is commonly compared in shape to a Hottentot's hut or a water bottle. This area of cardiac enlarge-



ment extends well to the right of the sternum as well as to the left anterior axillary line. Another characteristic is the change in the shape with the shift of position of the patient. This is particularly valuable in distinguishing between a pericardial effusion and a simple cardiac enlargement or an acute dilatation of the heart. Another physical sign is the enlargement of the liver and a tenderness elicited on pressure. Sometimes the history of an infection, particularly rheumatic fever or pneumonia, with the patient failing to make a proper recovery, may give a clue.

The electrocardiograph may give some important information such as changes in the QRS complex and the PR interval. The latter especially is important in acute rheumatic infection. I have seen one case which showed prolonged PR interval and upon examination I was able to detect a to and fro friction sound independent of the heart tones which was recorded in a stethogram. The patient had no symptoms at that time of acute rheumatic fever but did develop rheumatic fever two weeks later. If one finds a long PR interval, one knows there is some disturbance in conduction and even though the acute rheumatic fever is mild, there may be a severe heart damage. Patients with a prolonged PR interval are prone to develop auricular fibrillation later on in the course of the disease or later in life.

One condition for which one should be on the alert is acute myocarditis with dilatation and not confuse it with acute pericarditis with effusion. Electrocardiography may show changes which simulate coronary occlusion at times during the course of acute pericarditis; however, I believe careful examination, especially of the precordial leads, will easily give sufficient information to make a differential diagnosis between coronary occlusion and pericarditis. In any case the chest or precordial leads should be run if there are any doubtful factors about the case.

*Prognosis and Treatment.*—This depends on the cause and type. Pericarditis may not even produce symptoms or signs and may not be discovered until postmortem examination. The onset usually is rapid and the pericardial involvement in its acute stage is usually from a few days to a few weeks. The prognosis, therefore, depends upon the character and the pathological changes which take place within the pericardium.

Pericarditis of rheumatic fever may clear up without requiring paracentesis. It is usually spectacular in its response to the therapy of sodium salicylate. It is my opinion that this drug should be continued as long as there are any signs or symptoms of acute rheumatic fever or pericarditis is present. It should be continued in the treatment of pericarditis after the acute rheumatic fever has subsided. I consider this important as many cases under my care have made a good recovery follow-

ing the continued use of sodium salicylate in sufficient dosages. Many of these cases have been given sodium salicylate natural per rectum in a starch solution in 50 grain doses twice or three times daily for several weeks with no untoward symptoms except tinnitus or occasional nausea. It may be dropped for a few days and then resumed. I consider this the most practical way of giving sodium salicylate over long periods of time.

Pericarditis, as the result of pneumonia, may be influenced by treatment with sulfapyridine. I have seen a few cases in which the drug was used late in the disease apparently make a better recovery. It may be that the incidence of pericarditis following pneumonia may be markedly decreased by administration of this drug early in the course of the pneumonia.

Pericarditis of tuberculous origin has a high rate of exudate and may require repeated paracentesis to keep the patient in any comfort whatsoever as the dyspnea and orthopnea will return repeatedly and require relief. This may continue for several months, but in these cases the ultimate fate is sealed and the only hope is to relieve the patient. We suggest guinea pig inoculation for diagnosis in all cases of suspected tuberculous origin. If the effusion is not excessive, it is best left alone except in the purulent form of pericarditis, in which, of course, it should be drained. The patient should be treated with the indicated stimulants as the symptoms demand. He should have proper bed rest and diet and if secondary anemia develops, it should be treated. Many of these patients develop a tympanitis with gastric distress and they should be relieved of this complication as far as possible.

#### CHRONIC ADHESIVE PERICARDITIS AND CONGENITAL PERICARDIAL DEFECTS

These patients present a syndrome of decrease in cardiac output per beat per minute. A rise is noted in the venous pressure and there is a disturbance or interference with contraction due to an adherent and thickened pericardium. Broadbent's sign, which is an indrawing of the ninth, tenth and eleventh intercostal spaces in the left axillary line, is an important finding. This is caused by adhesion of the pericardium. Another finding may be a pulsus paradoxus. Many of these cases are mild and therefore the signs and symptoms are mild, causing the patient little embarrassment or discomfort. Occasional cases are exaggerated and may demand surgical intervention which has proven successful in several cases reported in the literature. Congenital pericardial defects are rare and of little clinical importance except that such a condition may occur.

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#### BIBLIOGRAPHY

1. White: Heart Disease, 1932.
2. Levins: Modern Concepts of Cardiovascular Disease, 2 (January) 1933.

## CORONARY ARTERY DISEASE

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Pathologically, coronary artery disease is an atherosclerosis of one or more of the coronary arteries. It may exist as a part of a generalized atherosclerosis. No tenable theory of its causation has been advanced. A familial trend is recognized. Twice as many males as females are affected. The incidence increases sharply after the fourth decade. The disease is usually progressive. There are no signs or symptoms of early, uncomplicated coronary sclerosis.

As the sclerosis progresses the lumen of the vessels is irregularly narrowed and their capacity to dilate is impaired. This results in a diminished myocardial reserve because of tissue anoxia when the functional demands on the heart are increased through effort, excitement, anemia or increased metabolism. Angina pectoris frequently accompanies the tissue anoxia. Dyspnea results from the decrease in myocardial reserve. Pain and dyspnea are the only symptoms of uncomplicated coronary sclerosis. These symptoms are not necessarily present nor are there any physical findings to suggest heart disease. The electrocardiogram may be entirely normal. Yet, the functional capacity of the heart may be sufficiently impaired that death may supervene through some as yet unexplained mechanism.

The results of coronary sclerosis may appear insidiously or with dramatic suddenness. The lumen becomes progressively narrower until obliteration of some of the fine branches results in a degeneration of certain muscle fibers. These are replaced with scar tissue. The end result is a fibrous tissue replacement hyperplasia. Such a myocardium is characterized by reduced elasticity, contractility and functional efficiency. The electrocardiogram reveals definite evidence of this myocardial degeneration. Pain or dyspnea may accompany increased functional activity of the heart. Disturbances in conduction and rhythm are common. Chronic myocardial insufficiency progresses over a period of years and ends in congestive failure.

The more dramatic episodes in coronary artery disease are the result of obliteration of the larger branches. This may result from embolism, thrombosis or some functional change which is presumed to be spasm. In any event a localized area of acute myocardial degeneration occurs at the site of vascular involvement. These areas are infarcts in every sense of the word, even though at times an actual thrombus cannot be found. Acute localized myocardial degeneration from infarction, with or without demonstrable embolism or thrombosis, is a catastrophe that can usually be recognized clinically and electrocardiographically.

The onset is dramatic with either pain or dyspnea or both. The pain is usually retrosternal and precordial and may radiate to the left shoulder, the left side of the neck and down the left arm. It is usually likened to a pressure sensation. It may be mild and inconspicuous or severe enough to require one or several doses of morphine. It may persist for hours or even days. It inspires a fear of impending death. Many bizarre variations of the pain have been described. Dyspnea may be the chief symptom. When marked, unmistakable evidence of congestive failure is apparent.

Shock from pain and vascular collapse is manifested by pallor, sweating and extreme prostration. The blood pressure falls precipitously.

Moderate fever, leukocytosis and an accelerated sedimentation rate result from absorption of the products of degeneration from the area of myocardial infarction. A transient glycosuria is frequently observed.

The clinical course of coronary thrombosis varies with the location and size of the infarct, the degree of preexisting sclerosis and the presence or absence of hypertension. The infarcted area degenerates and ultimately heals with scar tissue. Collateral circulation from the periphery reduces the area of degeneration to a variable extent. Mural thrombi form on the endocardium covering the infarcted area in about half the cases. Pericarditis is frequently encountered and is of diagnostic value. Death may occur from rupture of the myocardium, congestive failure, heart block, auricular or ventricular fibrillation. Embolic phenomena in the pulmonary as well as the systemic circulation result from detached portions of mural thrombi.

If death does not supervene the patient becomes fairly comfortable after a few days. The fever and leukocytosis subside gradually. The increased sedimentation rate may persist for weeks or even months.

The following postmortem data is from B. J. Clawson's survey of 928 cases of coronary sclerosis.\* Coronary sclerosis was responsible for one fourth of deaths from noncongenital cardiac disease. Sudden death occurred in 28 per cent. The anterior descending branch of the left coronary artery was involved most frequently. Thrombosis was present in 45 per cent of all cases; 32.5 per cent in the left, 10 per cent in the right and 3 per cent in both. Myocardial infarction was observed in 30.5 per cent of cases. Cardiac hypertrophy was identified as a result of hypertension rather than coronary sclerosis. Uncomplicated coronary sclerosis without thrombosis or infarction was found in more

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\*Am. Heart J. 17:387-400. Review in Year Book of General Medicine 1939, 551-553.



than half the cases. Myocardial fibrosis was seen in nearly all hearts examined.

A causal relationship between hypertension and coronary artery disease is suggested by their co-existence in more than half of the cases. Hypertension is at least a serious complication in that it increases the work of the heart. Hypertrophy places an additional demand on a coronary blood flow already reduced by sclerosis.

The diagnosis of coronary artery disease is based, first of all, on the history of pain or dyspnea with effort, the signs and symptoms of chronic heart failure and a clinical picture of acute myocardial infarction. These are essential features at varying stages of the disease. Hypertension with cardiac hypertrophy and obvious sclerosis of blood vessels elsewhere are strongly suggestive of coronary artery disease. Leukocytosis and increased sedimentation rate after acute myocardial infarction are corroborative evidence. Electrocardiographic evidence of myocardial degeneration makes the diagnosis of coronary artery disease obligatory. Several typical examples are included.

The treatment of coronary artery disease divides itself into the management of coronary sclerosis and the emergency treatment of the more dramatic incidents.

Pain and dyspnea in coronary sclerosis are warning signals that must not be ignored. Limitation of activity, even to the point of a change in occupation, and freedom from emotional stress, are desirable. Temperance in the use of alcohol, tea, coffee, food and tobacco is advisable. The treatment of coexisting disease is imperative. Diabetes, thyrotoxicosis, hypertension, anemia, focal and systemic infections, asthma, bronchiectasis, gallbladder disease and a variety of conditions deserve special attention.

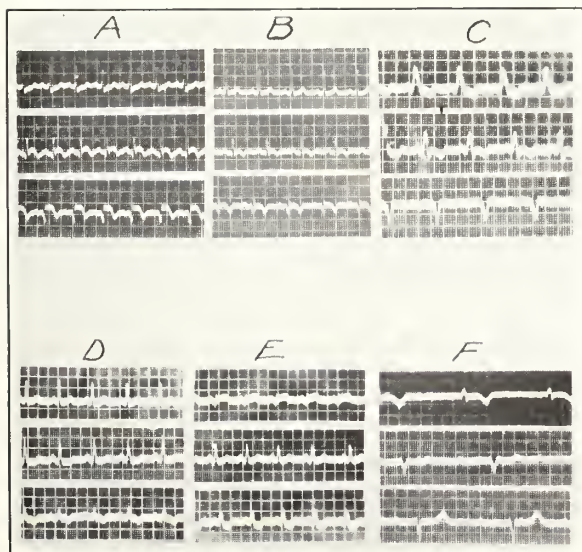


Fig. 1. A. Coronary sclerosis showing typical posterior infarction. B. Same patient three months later. C. Coronary sclerosis with typical bundle branch block. D. Coronary sclerosis with approximately normal tracing. E. Anterior infarction twenty-four hours after D. F. Coronary sclerosis with complete atrioventricular dissociation.

Vasodilator drugs such as the nitrites, the xanthines and alcohol may increase coronary flow temporarily and are therefore of value in both preventing and relieving pain. This is especially true when hypertension is present. Sedatives are especially helpful in the presence of nervousness, thyrotoxicosis, hypertension and emotional stress. Iodides are probably of no value except when thyroid disease coexists. Digitalis is indicated in the presence of congestive failure, both acute and chronic, and when auricular fibrillation supervenes. Mercurial diuretics, with or without ammonium nitrate, are of value in congestive failure. Quinidine meets a genuine need in the control of ventricular muscle irritability as well as an alternative drug in auricular fibrillation.

Acute coronary thrombosis is a medical emergency. Morphine is invaluable and enough should be given to relieve pain. Oxygen may be life saving and is always indicated in congestive failure and persistent pain. Absolute bed rest in the position of greatest comfort is imperative. Stimulants are contraindicated. Intravenous glucose should be condemned. Strophanthin is permissible as a last resort only. Digitalis is in order after forty-eight hours in the presence of congestive failure and fibrillation. Benzedrine sulfate may be used guardedly in the Stokes-Adams syndrome.

Bed rest should be continued for from four to twelve weeks. The best single guide in determining the bed rest required is the sedimentation rate. This, of course, must not replace sound clinical judgment in evaluating the symptoms of pain, dyspnea and the physical findings indicative of diminished cardiac efficiency. Actually, the sedimentation rate remains accelerated long after other signs and symptoms have disappeared.

The patient with coronary artery disease must be content to live the remainder of his life within the limits of his own cardiac ability. Temperance in eating, drinking, working and playing is imperative. He who would live must never ignore his trusted guides, pain and dyspnea. A philosophical resignation to diminishing myocardial reserve and the constant threat of a cardiac catastrophe requires either courage or despair.

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The failure of sulfanilamide to check infection due to two of the several types of streptococcus, some of which have proved susceptible to the drug, is reported in *The Journal of the American Medical Association* for March 9 by Alexander H. Rosenthal, M.D., and Florence M. Stone, Ph.D., Brooklyn, N. Y.

They cite two fatal cases in which sulfanilamide was given for endocarditis (inflammation of the inner membrane lining of the heart) complicating pregnancy. The infection in one case was due to group B and in the other to group C hemolytic streptococcus (a microbe capable of dissolving red blood cells). The authors believe that theirs is the first reported case of a fatal infection due to the group C streptococcus to occur in a human being.

## BEVERAGE ALCOHOL AND HEART DISEASE

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At one time or another practically every organ in the body has been accused of suffering irreparable damage from the ingestion of beverage alcohol. In this respect the heart has by no means been the least frequently cited. Careful investigations by physiologists, pharmacologists, pathologists and clinicians have failed to substantiate most of these dire prognoses. The physiologists and pharmacologists have shown that alcohol serves as a food for cardiac muscle.<sup>1</sup> Using the isolated rabbits heart, perfusion experiments were performed utilizing an oxygenated saline solution containing alcohol in strengths varying from .05 to .3 per cent. Such solutions produced definitely increased strength of myocardial contractions, whereas the stronger solutions showing a strength of .5 per cent or over had the opposite effect.<sup>2</sup> This latter concentration closely approximates the lethal limit for blood alcohol in man and the concentration of alcohol in the heart muscle of patients dying from acute alcoholic intoxication has been found to be .44 per cent.<sup>3</sup> Individuals with a blood concentration of .3 per cent are frequently stuporous. The conclusion to be drawn from these investigations is that the stimulating action of alcohol on heart muscle is due to its food value when it is administered in anything approaching average amounts. Some workers have disagreed with some of the above findings.

It is well known that small doses of alcohol produce a transitory increase in pulse rate which doubtless results from a depression of the inhibitory centers of the brain and a stronger heart beat and blood pressure are observed. When much larger doses are utilized there is a fall in the blood pressure and the pulse may become weaker.<sup>4</sup> The therapeutic application of such a series of observations is that in sudden and not too extreme myocardial failure, alcohol may be used with genuine benefit. Starting with a reflex stimulus from the stomach there is a temporary but definite rise in blood pressure through the mediation of the inhibitory centers of the brain thus producing a definite shift of blood from the viscera which lowers venous pressure and consequently decreases cardiac embarrassment. Moreover, the euphoric action of alcohol on the central nervous system tends strongly to decrease the degree of mental anxiety which usually accompanies such a trying experience.<sup>5</sup>

Pathologists have performed countless necropsy examinations on persons dying from acute and chronic alcoholism and paucity of pathologic cardiac findings has been an almost universal observation. In such individuals no known characteristic lesion is found either grossly or microscopically.

Not at all infrequently the actual cause of death cannot be determined until careful toxicological examination of the brain has been made.

Many years ago there was a condition captioned "Beer Drinkers Heart." This heart was usually a grossly hypertrophied organ which frequently showed fatty infiltration. Sometimes it was three or more times its normal size. The individuals examined, however, constituted a rather unusual class of drinkers in that they were of sedentary habits, grossly overweight and gluttonous overconsumers of all kinds of rich food.<sup>6</sup> It is of equal interest to note that this disease is practically unknown in America. The unique disappearance of so-called "beer heart" or "Munich heart" as a pathological entity was more or less coincident with the introduction of the sphygmomanometer.<sup>7</sup> This latter observation strongly suggests that essential hypertension with marked cardiac hypertrophy totally unrelated to the consumption of alcohol was in all probability the cause of the cardiac enlargement in the great majority of instances. One point is certain, essential hypertension as well as arteriolonephrosclerosis can be ruled out completely as being in any way related to the ingestion of alcohol.<sup>8</sup>

Arteriosclerosis also has been ascribed frequently to the moderate or immoderate use of alcoholic beverages. One need go no farther than the investigations of Cabot in 1904.<sup>9</sup> He studied 243 cases of chronic alcoholism in a home for inebriates. At necropsy the great majority of patients were past middle age. Certainly the majority should have shown the usual normal incidence of arteriosclerosis as observed in the general population of non-drinkers. Of this entire group who had been hospitalized because of hopeless chronic drunkenness only 6 per cent showed any evidence of arteriosclerosis. In Egypt the interesting findings of Sir Armand Ruffer<sup>10</sup> on total abstaining Mohammedan pilgrims who most certainly had never used alcohol in their lives is significant. He performed over 800 postmortem examinations and observed that arteriosclerosis was at least as frequent and occurred as early as it did in people who took alcohol regularly.

The observations of a wide group of investigators on the etiological factors in experimental arteriosclerosis may be of some interest. The investigations of Anitschow, Aschoff and Leary<sup>11</sup> all tend to show a relationship between cholesterol ingestion and atherosclerosis while the researches of Eberhard<sup>12</sup> demonstrated a definite protective action against the development of atherosclerosis when a combination of alcohol and cholesterol was fed to



animals while the control group fed cholesterol alone showed the usual striking incidence of atherosclerosis.

Leary<sup>13</sup> has made the statement that he has seen significantly few cases of coronary sclerosis in heavy drinkers. Paul White<sup>14</sup> critically analyzed 750 cases of angina pectoris. In this group he found only one person who drank very heavily whereas heavy drinkers were found far more commonly in a control group with no angina pectoris. White observed, however, that only eight patients of the 750 drank a considerable amount. One patient who was an excessive drinker was 66 years old and he had averaged at least a quart of strong liquor a day for over forty years. On the other hand this patient was an excessive eater and had had syphilis for forty-six years. In the other patients in the group of eight out of the 750 the one who drank the most survived for a longer time (twenty-three and one half years) after his first attack of angina pectoris than any other person in the entire series.

Master, Dack and Jaffe<sup>15</sup> made an exhaustive analysis of 379 cases of coronary artery thrombosis. These workers found less than 4 per cent of these patients to be heavy drinkers and they suggested that alcohol might actually protect one against such a serious tragedy as coronary thrombosis.

In a recent study Johnson<sup>16</sup> carefully studied 2400 electrocardiograms of apparently healthy normal males. He made careful physical examinations and studiously evaluated their complaints and habits. In this analysis he found that overweight was twice as frequent in the abnormal group which composed over 10 per cent of the total, whereas there was a higher percentage of alcohol drinkers in the normal group as compared to the abnormal group.

Thus it appears that alcohol per se is of no significance in the etiology of angina pectoris and coronary sclerosis whereas there is considerable evidence to show that it may have a definite and positive deterrent action on the development of atherosclerosis.

Paul White<sup>17</sup> and others have stated that alcohol may be of extreme benefit in coronary disease. In fact White has stated that an ounce or two of whiskey, brandy or rum can give relief from angina pectoris, usually within a few minutes.

In recent years a great many interesting clinical and experimental observations have come to light which have a bearing on the correlation between heart disease and dietary deficiency. With the advance in knowledge of avitaminosis a number of conditions formerly placed at the door of alcohol are now known to result from an incomplete or defective diet. Thus, so-called alcoholic polyneuritis, Korsakoff's syndrome, alcoholic beriberi and alcoholic pellagra are becoming increasingly more frequently recognized and properly evaluated.

In so-called alcoholic beriberi, the findings indicate that alcohol alone cannot possibly be the sole

etiological factor in the disease described. Beriberi is extremely rare when compared to chronic alcoholism. There is, furthermore, no evidence either clinically or pharmacologically that would suggest that alcohol alone ever produces heart disease. All the symptoms may be produced by a similar diet deficit in the absence of alcohol and they have been and frequently are known to take place long after the ingestion of alcohol has ceased. Chronic alcoholic addicts not infrequently have been found to have a low cevitic acid content of the blood and as Weiss and Wilkins<sup>7</sup> have said, "It is impossible that a substance through 'toxic action' should produce manifestations similar to those known to be caused by deficiency in vitamin B<sub>1</sub>, B<sub>2</sub> and C." The mere fact that all the symptoms and pathologic findings such as polyneuritis, pellagroid lesions and cardiovascular dysfunction disappear on continuous alcoholic intake provided Vitamin B is administered simultaneously, "should make it obvious to any thinking man that alcohol can only be a factor by providing food, energy and calories of such an excellent nature and so readily absorbable that the subject may totally disregard his vitamin and other dietary necessities."

What has been said about beriberi can likewise be said about pellagra and other types of cardiac disease associated with known specific avitaminosis. The classical beriberi heart frequently has baffled keen clinical observers. The clinical picture<sup>18</sup> of anorexia, vomiting, epigastric pain, edema, a greatly enlarged heart, gallop rhythm, tachycardia and an unusual distribution of the edema may be hard to evaluate. The distribution of the edema is of great clinical importance since in beriberi the face and genitalia show the greatest edema and it is most striking in the morning. This finding tends to suggest kidney failure rather than cardiac incompetence. The efficiency of the kidneys with a normal protein and plasma content and an absence of albumin in the urine should, however, arouse suspicion that the edema is not renal in origin.

There is no doubt that a striking deficiency in Vitamin B<sub>1</sub> may result in such a marked cardiovascular finding; on the other hand it should not be disregarded that lessened degrees of Vitamin B<sub>1</sub> deficiency may occur and pass unrecognized.

It, therefore, appears that in all cases of acute and chronic alcoholism with heart disease, an extremely critical and searching analysis of the dietary habits of the patient is of foremost importance in reaching a conclusion regarding the etiological background of the cardiac condition.

#### CONCLUSIONS

1. There is no evidence that alcohol per se is of etiological significance in any type of heart disease.

2. Alcohol can be utilized as a food by the cardiac muscle and may be employed therapeutically in certain cases of not too extreme myocardial failure.

3. "Beer Drinkers Heart" is an obsolete term and should be abandoned.

4. Arteriolonephrosclerosis and essential hypertension are not produced by alcohol.

5. Arteriosclerosis is not produced or accentuated by the consumption of alcohol and there is considerable clinical and experimental evidence to suggest that the regular ingestion of beverage alcohol may have an inhibitory action on the development of this condition. The same holds true for coronary atherosclerosis and resultant thrombosis.

6. Alcohol may be used therapeutically to good advantage in certain cases of angina pectoris.

7. Certain heart disorders associated with vitamin deficiency in alcoholic addicts may also occur in patients who do not use alcohol and will clear up in the former group when the proper vitamins are administered even though the use of alcohol is continued.

St. Luke's Hospital.

#### BIBLIOGRAPHY

- Himwich, H. E.: *Physiological Action of Alcohol*, Alcohol and Man, edited by Haven Emerson, New York, The Macmillan Co., 1932, p. 17.
- Wallace, G. B.: *Pharmacological Actions of Alcohol*, Alcohol and Man, edited by Haven Emerson, New York, The Macmillan Co., 1932, p. 49.
- Idem: Wallace, G. B., quoting Miles, p. 29.
- Reference 1, page 18.
- Reference 2, page 61.
- Martland, H. S.: *Pathology of Acute and Chronic Alcoholism*, Alcohol and Man, edited by Haven Emerson, New York, The Macmillan Co., 1932, p. 221.
- Weiss, S., and Wilkins, R. W.: *Disturbance of Cardiovascular System in Nutritional Deficiency*, J. A. M. A. **109**:786 (Sept. 4) 1937.
- Bruger, M. C., et al.: *Effect of Alcohol on the Normal Kidney and Kidney of Bright's Disease*, Experimental Study, J. A. M. A. **112**:1782 (May 6) 1939; McNider, W. de B.: *Preliminary Paper Concerning the Toxic Effect of Certain Alcoholic Beverages for the Kidney of Normal and Naturally Nephropathic Dogs*, J. Pharmacol. & Exper. Therap. **26**:97, 1925; Friedenwald, J.: *The Pathologic Effect of Alcohol on Rabbits*, J. A. M. A. **45**:780, 1905.
- Cabot, R. C.: *The Relation of Alcohol to Arteriosclerosis*, J. A. M. A. **43**:774, 1904.
- Ruffer, Sir Marc. Armand: *Studies in the Paleopathology of Egypt*, University of Chicago Press, 1921.
- Leary, T.: *The Therapeutic Value of Alcohol With Special Consideration of the Relations of Alcohol to Cholesterol, and Thus to Diabetes, to Arteriosclerosis and to Gall Stones*, New England J. Med. **205**:231-241, 1931.
- Eberhard, T. P.: *The Effect of Alcohol on Cholesterol-Induced Atherosclerosis in Rabbits*, Arch. Path. **21**:616-622, 1936.
- Leary, T.: *Discussion of Coronary Disease Before the Kansas City Academy of Medicine*, (February) 1939.
- White, P. D., and Sharfer, T.: *Tobacco, Alcohol and Angina Pectoris*, J. A. M. A. **102**:655-657 (March 31) 1934.
- Master, A. M.; Dack, S., and Jaffe, H. L.: *Factors and Events Associated With Onset of Coronary Artery Thrombosis*, J. A. M. A. **109**:546 (Aug. 21) 1936.
- Johnson, H. J.: *A Study of 2400 Electrocardiograms of Apparently Healthy Males*, J. A. M. A. **114**:561 (Feb. 17) 1940.
- White, P. D.: *Heart Disease*, New York, The Macmillan Co., 1931, p. 616.
- Jones, A. M., and Bramwell, C.: *Alcoholic Beri-beri Heart*, Brit. Heart J. **1**:187-198 (July) 1939.

## FUNCTIONAL HEART DISEASE

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Symptoms of neurosis are frequently referred to the heart because the heart is so susceptible to nervous influence and because certain mechanical features of the heart's action and variations in its function are readily apparent to the patient. Furthermore, heart disease has become such a commonly diagnosed ailment that the laity is keenly aware of it.

Disorders of the heart's action without demonstrable organic change are often termed functional heart disease. I believe this term should be discarded. It is ambiguous and should not be used in talking to patients. The use of the word disease convinces them that their symptoms arise from an actual pathological condition.

Much light has been thrown upon the problem of functional disorders of the heart and circulation by Anderson, Parmenter and Liddell<sup>1</sup> who produced an experimental neurosis in sheep and studied its effect upon the heart's action. The technic of producing an experimental neurosis is first to condition the animal to respond properly to certain signals. The positive signal requires a positive action and the negative signal requires that the animal remain motionless. Failure to distinguish between the two signals is punished by an electric shock. The two signals are then made so similar that discrimination between them is difficult or impossible.

For example, if different numbers of rings of an electric bell are used as the signals, the difference between them is made very small. The neurotic behavior then manifests itself and is due to a "clash between the neural activity of initiating a response and the neural activity of inhibiting the same response."

"The sheep," it was observed, "under reaction to stimulation manifested extreme restlessness; irregularity and rapid respiration and certain disorders of the pulse. These disorders consist of considerable increase of the pulse rate, irregularity of the pulse. The heart's action responded in an exaggerated manner to conditioned and other stimuli. Rapid increases of rate occur in response to mildly stimulating stimuli which have no effect upon the pulse of normal sheep. Spontaneous variations of rate are observed both in the barn and in the laboratory."

One need but substitute a few words in this paragraph to have an extremely accurate description of the manifestations of a cardiac neurosis in human beings. It is easy to apply this experiment to human beings for all have found themselves in situations in which in laymen's language, "we don't know which way to turn."

The outstanding characteristic of a patient with a cardiac neurosis is that his symptoms are greatly out of proportion to the objective evidence of heart



disease which the examiner is able to detect. The symptoms complained of in order of their importance are: (1) palpitation, (2) pain or a feeling of discomfort in the precordium, (3) irregularities of the pulse, (4) attacks of syncope and dizziness, (5) dyspnea. Most of these symptoms occur in actual heart disease and it is important to distinguish between actual disease and disorders of function. It is easy to convince a neurotic patient that he has heart disease but difficult to eradicate this idea once it has been firmly implanted.

First, one should determine if the patient has had or does have one of the diseases which results in a damaged heart. Ninety per cent of all heart disease is caused by three conditions: (1) rheumatic fever, (2) syphilis, (3) arteriosclerosis with or without hypertension.

A carefully taken history usually will determine the difference between the symptoms from which a cardiac neurotic patient suffers and those due to actual organic heart disease. Palpitation due to heart disease usually accompanies exertion and is the result of the laboring of a diseased organ trying to carry a load that is beyond its capacity. Palpitation in a cardiac neurotic patient has no relationship to exertion. It occurs when he is nervous or worried; most frequently at night. Patients often say, "My heart pounds so that it shakes the bed." When a patient says that during the day when he is active his palpitation does not bother him but when he is in bed at night it prevents sleep, actual organic heart disease is unlikely.

Pain in the left side of the chest is a frequent complaint. Again the symptom has no relationship to exertion. It is always in the region of the pectoral muscle because the patient thinks that his heart lies in this region. Actually pain due to heart disease has a definite relationship to exertion and is continuous only if coronary thrombosis has taken place. The major pain is nearly always in the midline. Anyone who says that he has pain continuously day after day whether he is active or quiet and is still able to go about his daily tasks is certainly not suffering from angina pectoris.

Many heart conscious patients notice the variation in the pulse which is associated with respiration. In some highly neurotic individuals this phenomenon of respiratory arrhythmia is so marked that even physicians are led to believe that it is due to actual disease of the heart. In order to make a differential diagnosis it is necessary only to observe the exact coincidence of the variations of pulse rate with the respiratory cycle.

Premature systoles are another source of anxiety to neurotic patients. These may or may not mean heart disease. In my own experience they have more often been due to cardiac neurosis than to actual disease. Unless other evidence of heart disease is found, they should be disregarded.

In the minds of the laity attacks of faintness are almost invariably regarded as "heart attacks." As

a matter of fact, syncope and attacks of unconsciousness are rarely due to heart disease except in unusual conditions as Stokes-Adams syndrome.

Dyspnea like palpitation has no constant relationship to exertion in the neurotic patient, but occurs most often when he is "nervous." The dyspnea may occur at night and mislead the physician because attacks of nocturnal dyspnea are so frequent in certain types of organic heart disease. The neurotic patient usually is able to lie comfortably in the horizontal position, whereas in the true cardiac patient the attacks are invariably associated with orthopnea. If the examiner observes the neurotic patient closely he will see that the respirations are irregular as to rate and depth and are punctuated by long deep sighing respirations. One does not, of course, find the rales that are heard in the congested lung of true heart failure.

A physical examination of a patient with a cardiac neurosis is frequently confusing. The pulse rate may be fast but, if the patient is observed over a period of time until he becomes accustomed to the physician and his office, the pulse will return to a normal rate. It also will be observed that the neurotic patient's pulse, like the pulse of the sheep used in the experiment, becomes fast from stimuli that have no effect upon the normal person. Such minor disturbances as dropping something on the floor or slamming the door will cause the patient's heart rate to increase perceptibly.

Because of the patient's accelerated pulse and accentuated heart action, there may be a snapping quality to the first heart sound which simulates that of mitral stenosis. The forceful apex beat may simulate a thrill. The situation is further complicated if there is a functional systolic murmur. Here again, repeated examinations will usually show that there are times when the heart action is perfectly normal. There is never a true diastolic murmur associated with the systolic murmur.

Of course a roentgenogram of the chest shows that the heart is not enlarged and its contour is normal. But one must be thoroughly familiar with the normal variations in contour of the heart. A prominent left pulmonary artery is often misinterpreted as meaning an enlarged left auricle. Conclusions concerning the heart's size should not be drawn from plates made at a distance of less than six feet or from ordinary fluoroscopic examination. Erroneous conclusions often are made concerning the left ventricle size in thick chested individuals with transverse hearts.

In the vast majority of neurotic patients the electrocardiogram is normal although premature systoles are often found which are more likely to be of significance if they are auricular in origin than if they are ventricular in origin. It is not rare to find distinct changes in the T waves similar to those found in coronary disease. If this is the case inquiry should be made concerning previous medication. It is astounding how many of

these patients take digitalis. If the digitalis is discontinued, the T wave changes disappear.

It is important to remember that a patient who actually has organic heart disease may have superimposed on this condition a cardiac neurosis. This is particularly true of patients who have had a coronary occlusion from which they have recovered but have residual electrocardiographic changes which persist and to which an exaggerated importance is attached both by the patient and physician. It is as true today as it was in the days of Sir James McKenzie who first emphasized that the true test of a heart is what it will do and not what one finds on physical examination or laboratory tests. This was aptly stated by a prominent cardiologist. A general practitioner had referred a heart case to him for study and exclaimed upon examining the cardiogram, "How can a man be up and walking around with a cardiogram like that?" To which the cardiologist replied: "My explanation is that a man does not walk with his electrocardiogram."

Frisco Building.

1. Anderson; Parmenter, and Liddell: *Psychosom. Med.* 1:93, (January) 1939.

## SPECIAL ARTICLES

### THE ELLIS FISCHEL STATE CANCER HOSPITAL

THEODORE P. EBERHARD, M.D.

COLUMBIA, MO.

The Ellis Fischel State Cancer Hospital, Columbia, was opened formally April 26, 1940.

Under the sponsorship of Governor Lloyd C. Stark, an enabling act was passed by the 59th General Assembly of Missouri which created a Cancer Commission with authority to build and operate a cancer hospital and to establish diagnostic clinics. The late Dr. Ellis Fischel, who was killed in an automobile accident early in 1938, was the first chairman of that commission.

The staff of the hospital consists of Mr. Harry W. Seekman, administrator; Dr. Theodore P. Eberhard, medical director and radiotherapist; Dr. Eugene Bricker, chief surgeon, and Dr. Lauren V. Ackerman, pathologist. These men are on a full time salary basis. The house officer group is composed of a resident and three assistant residents. Necessary supplementary services such as roentgen diagnosis and dentistry are handled on a part time basis and, finally, a consulting staff is made up of outstanding men in certain specialties from various parts of the state.

With the aid of a grant from the Federal Government's Public Works Administration, an eighty-three bed hospital was made possible. Ground was broken on September 29, 1938, on a

forty acre plot which had been donated by the City of Columbia on U. S. Highway 40 near the northwest limits of the municipality.

The building, modern in design and constructed of light and dark brown brick with aluminum trim, is eight stories high including a basement type ground floor. In this basement are located an autopsy room, store rooms, kitchen, dining rooms, a workshop, laundry, linen room and power plant. Two entrances are provided on the main floor, the west one leading to the administrative offices and the east one to the out-patient and follow-up clinic. In addition to the clinic, the record room and radiotherapy department occupy space in the east half of this floor.

The radiation therapy department is housed in a special wing extending northward from the east end of the building. Adjoining the treatment rooms are an examining room and a restroom for patients who are receiving radium treatments lasting only a few hours. Roentgen ray therapy is provided by three machines, each having a kilovoltage range from 80 to 220. In this way, through the use of appropriate filters, it is possible to use all three machines at all times regardless of whether the group of patients in the hospital at any one time is predominantly one requiring superficial treatment or one needing deep therapy. The hospital will have approximately 700 milligrams of radium, part owned outright and part loaned by the National Cancer Institute. A large portion of the radium will be in the form of removable platinum cells which can be placed in platinum and gold needles and capsules in many combinations. In this way, the usability of the quantity of element becomes the equivalent of a far larger amount in fixed containers. A supply of radon implanting instruments is owned, but the emanation will be purchased as needed instead of being produced at the hospital, thus avoiding the excessive cost of operating a radon plant.

Beds for patients are on the second, third and fourth floors, each floor having approximately twenty-eight beds. Balconies provide opportunity for sunshine and fresh air in warm weather. In the winter, ambulatory patients may use a comfortable lounging lobby or common room, which also serves as a visitor's waiting room, situated immediately in front of the elevators on each floor. In addition, there are the usual utility rooms, treatment room, diet kitchen and nurses station.

The fifth floor contains house officer's quarters, staff dining room, library, conference room, museum and photographic laboratory.

An operating room suite and general work room for nursing supplies fills the west half of the sixth floor, there being three operating rooms, the largest equipped with an observation balcony. At the east end of the same floor is the diagnostic roentgen ray department. This comprises a film reading room,



dark room, general diagnostic room and a cystoscopic room. In the general diagnostic room is a 500 milliamper machine equipped with a shock proof rotating anode tube mounted on rails beside a motor driven table, an undertable fluoroscopic tube with spot-film device and an automatic cassette changer for stereoscopic chest work. The cystoscopic room contains a cystoscopic table with a built-in 100 milliamper roentgen ray unit and a Potter-Bucky diaphragm.

The pathologist's office is located on the seventh floor with the pathology, chemistry and bacteriology laboratories. The penthouse which tops the building contains elevator machinery, water-tanks and a storeroom.

No effort was spared and no details overlooked to make the hospital not only one of Missouri's finest buildings but also one of its most durable. Furthermore, the design allows the greatest flexibility under the varying type of case load which the institution will be called upon to handle.

Admission to the hospital is dependent upon the satisfactory fulfillment of the requirements of medical indigency and the possession of a definite or definitely suspected cancerous or precancerous lesion. A sworn financial statement and report of an examination by a physician must be presented as supporting evidence before the county court, the judges of which may then issue an order sending the patient to the hospital. Standard forms covering this procedure have been furnished by the hospital to the county courts, or will be sent to anyone, upon request, for specific patients. There follows an examination by the members of the medical staff of the hospital and if, in their opinion, the patient does not have cancer, they will recommend to the administrator that the patient be sent back for care in his local community. The cost of the examination and treatment is borne by the state, except for a sum of \$5.00 a month per patient for which the county court is billed by the hospital. Transportation to and from the hospital must be provided either by the patient or by the county court. The law provides that the court may appoint a physician to examine any patient applying for admission to the hospital.

Once a patient has been accepted for care at the hospital, it is intended that he shall not be lost sight of before a minimum of five years has passed, and in most instances he should be followed for the rest of his life. In case of death, the hospital wishes to obtain as complete information as possible concerning the immediate cause of death and the patient's condition at the time of death. To do this, there is a department in the hospital the primary task of which is to keep in touch with the patients after they have been discharged. In addition, this department assists in arranging transportation for the patients to and from the hospital, in obtaining proper medical and nursing care for the patients after their return home and in maintaining contact between the hospital and the individuals and or-



Dr. Theodore P. Eberhard, medical director (upper left); Mr. Harry W. Seekman, administrator (upper right); Dr. Eugene Bricker, chief surgeon (lower left); Dr. Lauren V. Ackerman, pathologist (lower right).

ganizations involved in the cases in the local communities.

In the statute there is provision for active financial support by the Cancer Commission of a statewide program of cancer control including the establishment of cancer clinics and providing follow-up case workers. The Commission hopes to develop plans in regard to this, now that the hospital has been completed. As a beginning, staff members of the hospital have organized ward rounds, conferences and various types of clinics. Members of the medical profession are urgently invited to observe the day-by-day routine work at any time.

It is the aim of the Commission and the staff that the Missouri cancer program shall serve as the model upon which other states of the Union will wish to pattern their programs. The road the Commission has chosen is, for the most part, unlighted by precedent. The staff comes to its tasks realizing that herein is an opportunity to progress in a field in which constructive action, such as this, is most laudable and surely greatly needed. The staff pledges to its medical colleagues its wholehearted cooperation in the solution of mutual problems. In return the staff asks only that it may be considered worthy of closest scrutiny and most sincere criticism. By combined efforts the goal set by the Commission may be achieved and the dream of Ellis Fischel brought to a glorious fulfillment.

Ellis Fischel State Cancer Hospital.

## MISSOURI'S PROBLEM WITH PRENATAL SYPHILIS

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ST. LOUIS

Because conditions concerning congenital syphilis are not readily apparent, one may ask quite properly: To what extent is congenital syphilis a real public health problem? I am forced to reply that I honestly do not know. Nor, do I believe any other person, official or unofficial, either in Missouri or in the entire United States, knows exactly.

There are laws in Missouri requiring reporting, segregation or quarantine of syphilis as an infectious disease. Laws alone do not make a good accumulation of statistics or even good public health control. Until recent years there has been only indifferent cooperation of people or profession. A prolonged campaign of education, legislation, detection and medication appears to be the only sensible and probably successful solution to this unfortunate problem.

A campaign such as is required must be planned, supported and executed with all the care, sustained effort and tactical consideration used in a guerrilla warfare. Such a campaign is being planned. Syphilis is the guerrilla that hides behind ignorance, fear and prudery. An estimate of the situation is somewhat as follows: Syphilis, the enemy, is unorganized and rarely becomes epidemic, or "organized." Therefore, the campaign must be predicated on the principle of the dragnet to discover every case humanly possible. After discovery, the methods available for the control of the individual case and the future of his personal disease are medicines, physicians and public health officials.

Public opinion really is only beginning to awaken to the menace of syphilis. However, in some cases physicians do not seem to realize how much this awakening has progressed. Suffice it to say that syphilis can be mentioned now in the press and mixed public meetings of adults can be addressed about the disease without invariably scandalizing the assembly. Already hundreds of civic organizations are willing to sponsor the fight against syphilis. About two thirds of the state legislatures have passed new laws directed at syphilis during the last three years. Much time and infinite patience is being expended by various agencies on public opinion in venereal disease control and it is through this channel the medical profession and the public health officials will be commissioned to eradicate the disease.

Thus, the control and eradication of congenital syphilis is necessarily a part of the general campaign to eradicate syphilis. Congenital syphilis is a good starting point. For some reason it seems easier for the lay mind to become active on the subject of prenatal prevention and treatment than on premarital preventive measures.

Public education is lagging so far behind medical

science that physicians and public health officials have not been able to exert to the fullest extent the police power of the department of health or to comply fully with the laws governing the reporting and care of venereal diseases. How big the problem really is cannot be known until accurate data can be accumulated. There is good reason to believe 1 or 2 per cent of prospective mothers have syphilis. It is thought that from 1 to 2 per cent of people ready to marry have syphilis. One in ten persons has had, has or will have syphilis under present conditions. There is one potentially comforting aspect of this situation: The problem will almost be solved if and when the disease is under sufficient control so that accurate information about it invariably can be secured. During the next few years disagreeable and appalling facts probably must be faced.

A survey indicates the City of St. Louis has had, on paper, an average rate of forty-five stillbirths for each thousand births. Many of these stillbirths are due to syphilis but they are not so designated. Then there is the ridiculous figure of twelve deaths annually in infants under 1 year of age, due to syphilis. It is ridiculous because it is grossly underestimated and improperly reported.

Knowledge about the entire State of Missouri is no better. The Health Department knows there has been an annual average of 58,625 births for five years. The birth rate is 14.94 per thousand population. There are 2,076 average annual stillbirths. Thus far the figures are probably accurate. When syphilis was reported present in 366 cases with a baby syphilis mortality rate of 9.36, there is good reason to believe these syphilis statistics are inaccurate and "minimal."

The United States Public Health Service knows there are 76,933 annual stillbirths in certain years (1932-36) and that about 2.4 per cent of these are reported to be caused by syphilis. Here again, a national average of 1,847 stillbirths due to syphilis is a misleading figure.

A release on April 30, 1939, by the United States Public Health Service shows that 25,000 babies die needlessly of syphilis each year. There are also about 60,000 babies born with syphilis each year. If they are not malformed at birth, they are prone to develop blindness, paralysis, feeble-mindedness or insanity in the years to come. They are a good source of public charges.

The social and public health cure for this unhappy situation in Missouri, and for the United States as well, may be summarized as education, legislation, detection and medication. Every thinking person must be educated to several fundamental facts as follow:

(1) If the father has syphilis, it will be in the newborn child under certain circumstances. If the pregnant woman has syphilis it almost invariably will be transmitted to the child unless there is medical treatment.



(2) There are about 15,000 congenitally syphilitic first babies born in the United States annually, about 450 in Missouri. Premarital blood tests would be useful in these cases but prenatal blood tests could prevent most of these cases of syphilis by calling attention to treatment when needed.

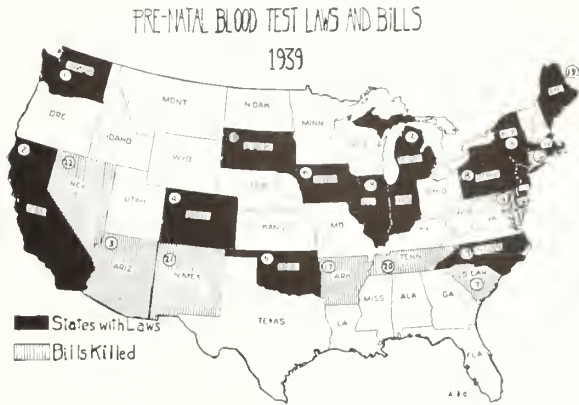
(3) In order to prevent the other 45,000 annual cases of congenital syphilis, people must want to discover syphilis early in every pregnant woman who has the disease. If each pregnancy is to be so investigated, it will require education and legislation to make the ideas of detection and medication effectual.

(4) If a syphilitic pregnant woman is treated properly, beginning before the fifth month, two cases of syphilis are being treated. More than nine times out of ten the baby will be born free of the disease. The reverse is too often true if the mother is not treated or is treated improperly. Almost invariably the baby will be born infected. Missouri's additional 1,350 reported cases of congenital syphilis can be prevented annually by early discovery and treatment of the disease.

Approaching Missouri's problem from a somewhat different viewpoint of estimation, which will probably give nearer the correct figures, one may assume Missouri has 3 per cent of the population of the United States. Then prenatal blood tests made in the first months of all pregnancies might prevent 1,800 annual cases of congenital syphilis, at present rates, and about six hundred baby deaths in this state. This is worth doing even if it may mean performing 64,000 blood tests annually on prospective mothers. According to the previously quoted

United States Public Health Service release, "Five months of treatment before birth of the child is worth more than five years of treatment afterward."

(5) The public expects the medical profession to lead in matters of public health. To fail to assume some leadership against syphilis only allows less qualified persons to do so.



Missouri will not be alone in considering this prenatal approach to congenital syphilis. In 1938 three states (New York, New Jersey and Rhode Island) passed prenatal blood test laws and in 1939 fourteen more states passed similar laws.

The Missouri Social Hygiene Association has proposed the following prenatal blood test bill:

An Act to Further the Control of Congenital Syphilis by Requiring a Serological Blood Test for Syphilis in Pregnant Women, and Providing Penalties for Violation.

Table 1. Prenatal Blood Test Laws

State	Date	Blood Spec. Taken		Approved		By Whom		Data on Report					Penalty			Emergency Clause	Special Remarks
				Test	Lab.	Phys.	Others	Birth	Still birth	Date*	Fail¹	Result	Violation Misdem.	By Woman	Free Tests		
		1st	Days														
Calif.	'39	Yes	10	St.	Yes	Yes	Yes	....	....	....	....	....	Yes	No	....	....	Special Form for Test
Colo.	'39	Yes	10	St.	Yes	Yes	Yes	Yes	Yes	Yes	....	No	Yes	No	R	Yes	
Del.	'39	Yes	....	St.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	....	....	R	Yes	
Ill.	'39	Yes	....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	....	No	....	....	R	....	Repeat Doubtful or Positive Tests Religious Waiver Religious Waiver Confidential Test
Ind.	'39	Yes	....	St.	Yes	Yes	Yes	Yes	Yes	Yes	....	No	....	....	....	....	
Ia.	'39	....	14	St.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	....	....	R	....	
Me.	'39	....	....	St.	Yes	Yes	....	....	....	....	....	Special Report	....	....	R	....	
Mass.	'39	Yes	....	St.	Yes	Yes	....	....	....	....	....		....	....	....	....	....
Mich.	'39	Yes	....	St.	Yes	Yes	Yes	Yes	Yes	Yes	Yes		No	....	....	R	....
N. J.	'38	Yes	....	St.	Yes	Yes	Yes	Yes	Yes	Yes	....	....	....	....	R	....	Confidential
N. Y.	'38	Yes	....	St.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	....	....	....	....	
	'39																
N. Car.	'39	R	R	St.	Yes	Yes (R)	Yes	Yes	Yes	Yes	....	....	Yes	R	I	....	Confidential
Okla.	'39	Yes	....	St.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	....	....	....	....	Consent or Request of Woman
Pa.	'39	Yes	15	St.	Yes	Yes	Yes	Yes	Yes	Yes	0	....	Yes	Yes	I	....	
R. I.	'38	Yes	30	St.	Yes	....	....	....	....	....	0	....	Yes	....	....	....	
S. Dak.	'39	Yes	....	St.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	....	....	R	....	Phys. to Urge Tests Before 5th Mo. of Pregnancy
Wash.	'39	Yes	....	St.	Yes	Yes	....	....	....	....	....	....	....	....	R	....	

\*Date of test. †Reason test not made. R=On request. I=For indigents. St.="Standard."  
O=Optional for physician.

Section I. Serological Blood Test for Syphilis in Pregnant Women. Every licensed physician, midwife, lay attendant and all persons who may undertake the obstetrical and gynecological care of pregnant women in the State of Missouri shall, in the case of each woman so attended, take or cause to be taken a sample of venous blood of such woman at the time of the first examination, or not later than twenty (20) days after said first examination, and subject such sample to an approved and standard serological test for syphilis. An approved and standard test for syphilis shall mean a test made in a laboratory approved by the State Department of Health. Such tests for indigents shall be made free of charge by the Department of Health on request.

Section II. As soon as the result of the test is determined, and if the test is positive or doubtfully positive for syphilis, the physician, or such other obstetrical or gynecological attendant shall fill out a form to be furnished by the State Department of Health, with such finding noted thereon, and send it to the county or municipal department of health of the county or city in which the pregnant woman is then residing, which department shall assume such supervision as may be necessary to protect the public health. In no event shall this finding be made public by any person.

Section III. In reporting every birth, and stillbirth, physicians and other persons attending pregnancy cases and required to report births, and stillbirths, shall state on the report of birth, or stillbirth, whether a blood test for syphilis has been made during such pregnancy upon a specimen of venous blood taken from the woman who bore the child, and, if made, the date when and where such test was made, and if not made, the reason why such test was not made. No report of birth, or stillbirth shall contain the result of such blood test.

Section IV. Any licensed physician, midwife, lay attendant, or other person who may undertake the obstetrical and gynecological care of pregnant women in the State of Missouri, who wilfully and maliciously publishes the result of said blood test, or who, if a blood test is made, fails to follow out the provisions stated in Section II of this act, or who fraudulently and in bad faith shall misrepresent the facts contained in the form mentioned in Section II of this act, or the report of birth mentioned in Section III of this act, shall be fined not less than ten (\$10) dollars nor more than one hundred (\$100) dollars for each offense.

Section V. (Appropriation Clause)

Section VI. This act shall take effect immediately.

For the health department to approve a serological test for syphilis, as such laws invariably specify, is an entirely different procedure than approving a laboratory which may perform such approved tests. The proposed bill of the Missouri Social Hygiene Association wisely calls only for the use of "an approved and standard serological test for syphilis . . . shall mean a test made in a laboratory approved by the State Department of Health." It says nothing about how laboratory approval shall be attained and, thereby, leaves that problem to others competent to solve it. The State Board of Health is now engaged in ascertaining the laboratories it can approve.

There are these points for the medical profession to consider about the proposed prenatal blood test bill:

(1) The bill makes it obligatory for the physician—and those others legally allowed to care for pregnant and parturient women—to have made, or attempt to have made, a standard serological blood

test for syphilis in each maternity case. This is only a standard practice of good obstetrics anyway. Thus the law would elevate the standards of obstetrics generally.

(2) The bill, if it becomes a law, does not compel the woman to submit to such a test. Should the physician fail to have the blood test made by reason of lack of consent of the pregnant woman, he will be none the worse off in his obstetrical practices than he is now when the patient refuses to have a blood test, and none the worse in the eyes of the law.

(3) Health departments, even were they to become officious, cannot interfere with obstetrical cases when there may be a positive blood test and a qualified physician has the case. The medical profession has been harried for several years because of the shortcomings of unqualified or indifferent persons practicing obstetrics and patients failing to seek or heed competent advices. Such a law as the one proposed eventually should help bring some improvement in the maternal and infant mortality rates.

(4) In the case of the qualified and conscientious physician, the proposed law does not interfere with his practices at all. It would merely legalize a certain phase of good obstetrics.

(5) Such a law and a demand for more and accurate tests for syphilis, in turn, might help to solve the laboratory problem which is known to exist in Missouri. Most qualified laboratory practitioners who have been consulted approve the proposed bill but object to any "laboratory licensing." The majority of the laboratories, however, are cooperating voluntarily to be placed on the approved list.

#### SUMMARY

Within the last two years seventeen states have passed prenatal blood test laws for the prevention of congenital syphilis.

Missouri probably has about 1,800 new cases of congenital syphilis each year.

The Missouri Social Hygiene Association has presented a proposed bill to the Missouri State Medical Association for endorsement.

The proposed bill, if it becomes a law, should elevate the standards of obstetrical practice generally and cannot interfere with qualified physicians in their obstetrical practices.

Pasteur Building.

#### ANEMIA REQUIRES FREQUENT TREATMENTS

The majority of patients with pernicious anemia cannot be satisfactorily treated by injections of liver extract at long intervals even if massive amounts are given, Maurice B. Strauss, M.D., and Frederick J. Pohle, M.D., Boston, assert in *The Journal of the American Medical Association* for April 6.

"The optimum interval between injections for most patients with pernicious anemia is from one to four weeks," they declare.



# THE JOURNAL

of the

Missouri State Medical Association

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MAY, 1940

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## EDITORIALS

### THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

### THE ENSUING STATE MEETING

The Joplin Session, which will convene on April 29, 30 and May 1, promises to be one of the best and most valuable sessions the Association has held. Those who attended the Annual Session in Joplin in 1931 know that the Jasper County Medical Society, the host society, is efficient in its preparation for the meeting and most hospitable.

An excellent and diversified program including ten out-of-state speakers has been arranged, augmented by round table luncheon meetings on two days and the Maternal Welfare Committee's annual meeting at noon on the first day.

A number of scientific exhibits will portray various phases of medical practice and twenty-one commercial exhibits will cover the field of new products, new apparatus and new books of interest to the physician.

The dinner for Past Presidents on Monday evening will combine fellowship with serious consideration of problems of the profession. Dr. Nathan B. Van Etten, New York, President-Elect of the American Medical Association, will address this meeting.

The scientific program for the Session is repeated in this issue on page 217 that members who cannot attend the whole Session may select the day on which they wish to attend.

Members are urged to attend the Session, not only because it will be of value to them but because the Association needs the support and encouragement of every member. Problems pertinent to the profession as a whole and to members individually will be discussed and attempts made to formulate more definitely the policy of the Association.

### DISABLING DISEASES OF CHILDHOOD

The decline in the death rate which has occurred in the present century is largely the result of the reduction in the mortality of childhood. This is largely because the diseases most successfully controlled, those infectious in nature, most frequently attack children. However, children continue to have a high frequency of illness, of which the preventable diseases remain the major cause.

The United States Public Health Service recently issued a review<sup>1</sup> of disabling illnesses of childhood over a twelve-month period as shown in the National Health Survey made by the Service in 1935 and 1936. The survey covered eighty-three representative urban communities and records for 518,767 white children under 15 years of age were obtained. Disabling illness was considered as those which prevented the usual activities of the pre-school child or school attendance of the child of school age for at least seven consecutive days in the twelve-month period.

Disabling illnesses occurred with greater fre-

1. The Disabling Diseases of Childhood, Public Health Reports 55:135 (January 26) 1940.

quency among children under 10 years of age than in any subsequent period except old age. However, the severity and therefore the duration of the disabling illnesses was lowest in children. As a result the amount of disability accruing from the illnesses of childhood was disproportionately low with reference to the high frequency of illness at this period. The rate of recovery was found appreciably higher among children than among adults, except in the case of infants.

The maximum incidence of illness in childhood was in children between the ages of 5 and 9. Children between 5 and 9 experienced eight days of disability per capita. Next in order was the rate for children of preschool age, seven days per capita. The lowest disability rate observed in childhood was five days per capita among children 10 to 14 years of age.

Four in every five disabling illnesses occurring among children under 15 years of age were due to acute communicable or respiratory diseases; these diseases accounted for over half of the disability experienced by the average child in the twelve-month period. Broadly considered, the control of the acute communicable and respiratory diseases represents the major problem in the field of child health since many of these diseases are preventable.

Permanent orthopedic impairments incapacitated twelve in every 10,000 children under 15 years of age for at least a week during the survey year; the average duration of disability per case was approximately eight months. Permanent orthopedic impairments, including all cases without reference to the resultant incapacity, were found in 49.5 per 10,000 children under 15 years of age at the time of the survey. Congenital defects, accidental injury and poliomyelitis were reported most frequently as causes of impairments in this age period.

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## NEWS NOTES

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Dr. E. Lee Dorsett, St. Louis, was a guest speaker at the annual meeting of the Arizona State Medical Association held at Tucson, Arizona, April 18, 19 and 20. Dr. Dorsett presented lectures under the auspices of the Arizona State Board of Health at Douglas on April 22, at Phoenix on April 23 and at Yuma on April 24.

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The St. Louis Clinics annual postgraduate course and clinical conference will be held in St. Louis May 13 to 16. The program includes four daily programs from 9:00 a. m. to 5:00 p. m., two evening programs and three round table luncheons. On the first day Reserve Officers of the Army and Navy will conduct clinics. St. Louis physicians will conduct the program on the other days. Dr. George Herrmann, Galveston, Texas, Professor of Medicine, University of Texas School of Medicine,

will be the guest speaker at a dinner meeting May 14, held jointly with the St. Louis Medical Society.

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Dr. James R. L. Womack, Houston, in practice in Texas County for forty-six years, received much acclaim when on December 28 he canceled all professional bills owing him, according to an article in the *Houston Herald* of February 22, reprinted from the *Springfield News Leader* of February 11. Dr. Womack terms himself a saddlebag doctor rather than a horse and buggy doctor. He is 76 years old. He has been a member of the legislature and has been coroner for several years. He is continuing his practice of medicine.

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Dr. Quitman U. Newell, St. Louis, was a guest of the Mid-South Post Graduate Medical Assembly at Memphis on February 15 and spoke on "The Treatment of Retrodisplacement and Prolapse of the Uterus." On March 11, Dr. Newell spoke at the Medical Department of the University of Alabama at Tuscaloosa, Alabama, on "Sterility in the Female." On March 12 he addressed the Southeastern Surgical Congress at Birmingham on "Lesions of the Vulva and Their Treatment," and on March 26 and 27 he spoke before the New Orleans Graduate Medical Assembly on "Irradiation Therapy in Gynecology" and "Retrodisplacement of the Uterus."

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The twenty-fifth annual meeting of the American Association of Industrial Physicians and Surgeons, together with the first annual meeting of the American Industrial Hygiene Association, will be held at Hotel Pennsylvania, New York City, June 4, 5, 6 and 7. The meeting will be devoted to the problems of industrial health in its various medical, technical and hygienic phases with particular stress on prevention and control of occupational hazards. Technical and occupational exhibits will be features of the meeting. The William S. Knudson award for the year 1939-40 will be presented at a dinner on June 6. The medical profession is invited to attend the sessions.

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The American Physicians' Art Association composed of more than eight hundred physicians in the United States, Canada and Hawaii who follow some form of fine and applied art as an avocation will hold its annual art show at the Belmont-Plaza Hotel, New York City, June 10 to 14, at the time of the American Medical Association Session. All physicians in active practice or retired who have an art hobby including photography are invited to participate in the New York exhibit. Membership may be obtained by mailing \$1.00 to the treasurer, Dr. R. W. Burlingame, San Francisco County Hospital, San Francisco, and stating the art medium the applicant follows. Information may be obtained from the executive secretary, Dr. F. H. Redewill, 526 Flood Building, San Francisco.



## ORGANIZATION ACTIVITIES

### CAPPER-EPSTEIN BILL

In an editorial in the *Journal of the American Medical Association* of April 6 outlining the provisions of the revised Capper-Epstein Insurance Bill the present time is described as "the open season for weird efforts at plans and legislation to solve medical problems." The editorial states:

And now comes still another edition of the health insurance bill sponsored by the American Association for Social Security through Mr. Abraham Epstein. Again this perennial was introduced in the Senate, May 25, as S. 3660, by Senator Capper, of Kansas, who has sponsored practically all previous editions. The present bill proposes a federal appropriation of \$50,000,000 for the fiscal year ending June 30, 1941, and thereafter as much as may be necessary, to induce the states to embark on a combined program of compulsory and voluntary health insurance. The Social Security Board must approve all state plans. Exempted from the compulsory features of any state plan, it is proposed, will be those engaged in agricultural labor, in domestic service for an employer having less than three employees engaged in such service, and services performed by a minor who is actually in regular attendance during the day time as a student in an institution of learning.

Plans must provide for cash benefits for loss due to disability and for medical benefits. The fund out of which benefits are to be payable is to be created and maintained by regular premiums paid by the state, employers and employees set according to wage classes, and by federal donations. The amount of the cash benefit to be paid an individual must be fixed according to the wage class of the individual and according to the number of his dependents. The administration of a state plan will be lodged in a central state board, a state commission of health insurance and a statewide system of local councils and local administrative offices.

Medical benefits must be supplied to employees coming within the scope of the scheme and to their dependents. Local councils will prepare and publish lists of physicians, dentists, nurses and others who have previously agreed or with whom arrangements have been made to furnish medical benefits, and an employee will be permitted to select from such list the general medical practitioner and the general dental practitioner or the group of such practitioners by whom he wishes to be treated. For services rendered under a state plan the physician, dentist or other person or institution rendering them will be paid according to the manner of remuneration decided on by the local council, which may be a salary system, a per capita system, a fee system or a special arrangement with a group of practitioners.

The federal government, the bill proposes, will contribute to any state that has an approved plan for health insurance an amount equal to one half of the total of the premiums required to be paid by a state, this part of the federal subsidy to be used exclusively for the supplying of benefits. In addition, the federal government will pay 5 per cent of the state premiums to be used for the paying of the cost of administration for administering the state plan or for benefits, or for both. The bill is pending in the Senate Committee on Education and Labor, along with the Wagner health bill, the Lodge health bill, the Wagner-George hospital construction bill, the Mead hospital construction bill and various and sundry others.

If there is any fault inherent in any compulsory insurance system that is not present or even intensified in this new Epstein concoction, these weary eyes fail to detect its absence.

### COURT OF APPEALS' DECISION

In an editorial discussing the complete statement of the decision of the United States Court of Appeals for the District of Columbia in the case of the government versus the American Medical Association and various other organizations and persons, *The Journal of the Association* for March 16 points out: "This statement summarizes the indictment and analyzes the case as being concerned with three main problems.

"These raise essentially the question as to whether or not there was a combination or conspiracy in restraint of trade as that term is used in the Sherman Act and whether or not the indictment was defective in form. There is a considerable discussion of the significance of the phrase 'restraint of trade' and various previous legal decisions on the subject are cited, leading the court to the ultimate conclusion that the effect has been to enlarge the common acceptance of the word 'trade' to cover all occupations in which men are engaged for a livelihood.

"Although the court recognized the great public value of the work of organizations in raising standards of conduct and skill, it was also of the opinion that medical societies may not legally effectuate restraints as far reaching as those which are charged. The court pointed out, of course, that the charge may be wholly unwarranted and the facts, when they are disclosed on the trial, may show an entirely different state of affairs. For the purpose of the decision in the present case, however, the court felt that it must consider the charge as though its verity were established, and if that point of view is taken the court felt that the offense is within the condemnation of the statute. The court then went into the question of corporations practicing medicine and said that, where a corporation operates a clinic, employs physicians and surgeons to treat patients and itself receives the fee, the corporation is unlawfully engaged in the practice of medicine. However, the court was of the opinion that, assuming the allegations of the indictment to be true, Group Health Association, Inc., was something different and, therefore, left open until the trial of the case the question whether or not Group Health Association, Inc., was illegally practicing medicine. Finally, the court took up the charges that were made as to the insufficiency of the indictment and reversed the opinion of the lower court on that point.

"The repercussions from this decision by the Court of Appeals are already considerable; many of the opinions expressed indicate that this action is far from ending the consideration of this important subject. It becomes apparent at once that every labor as well as every other professional organization in the United States is intimately concerned with this decision. The *Washington Post* points out that it is well to remember that this opinion is not final, that the Supreme Court has not yet spoken and that, even should the Supreme Court sustain

the Court of Appeals rather than Judge Proctor, it would still remain to be seen whether the persons charged in the indictment can be convicted under the indictment.

"Between the time when the questions relating to the Group Health Association, Inc., were first raised and the time of this decision by the Court of Appeals, many changes have taken place in the structure of American medicine. The question of distribution of risk by the insurance method in meeting the costs of medical service and the relationship of organized medicine to that question can certainly not now be raised, since some fourteen state medical organizations and innumerable smaller medical units in medical organization are themselves engaged in such plans. The Group Health Association, Inc., seems to be functioning, at least to its own satisfaction, in the District of Columbia, and the Medical Society of the District of Columbia itself has a plan for medical service which is also in the status of an operating experiment.

"The decision as to whether or not medicine is a profession or a trade is exceedingly important not only as relates to this case but also in relationship to many another piece of legislation of utmost concern to every scientific, professional, educational and similar organization in the United States. There are numerous problems associated with the laws regulating taxes, social security, licensure and innumerable other rights and privileges involved in medical practice which depend greatly on the distinction between the practice of a profession and a trade or other occupation.

"Thus the decisions made by the courts in relationship to the questions that have been raised are basic and far reaching in their ultimate effect on every organized professional body in this country. The principle at issue involves the right of any professional group to regulate its own conduct and even to determine its own membership. As even the Court of Appeals recognized, the existence of such organized bodies has served vastly for the benefit of the people, achieving objectives in raising the standards of education and of service far beyond those which might have been achieved by any other sort of effort, including no doubt even efforts that might be made by various legally constituted or governmental agencies.

"Perhaps the thought is in itself a reflection on our present system of social organization, but it is interesting to realize that the determination of the issue on which the Court of Appeals has just made a pronouncement and on which the Supreme Court has yet to rule is of little or of no importance as relates to the provision of medical service at low cost for large numbers of people. It may be of vast significance, however, in serving to bring about revolution in the existing social organization through the breaking down of established bodies. Such a revolution Mr. Thurman Arnold seems to desire if one interprets correctly his book 'The

Folklore of Capitalism.' The issue involved is thus fundamentally whether or not our democracy as now existing is capable of meeting the needs of civilized man or whether some completely new social scheme is going to be necessary to satisfy those officials of government who have taken on themselves the task of creating a new order."

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## DEATHS

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**Julius H. Weinsberg, M.D.**, St. Louis, graduate of the Marion-Sims College of Medicine, 1891; member of the St. Louis Medical Society; died February 1.

**Harold Blaine Scovern, M.D.**, Carrollton, graduate of Jefferson Medical College of Philadelphia, 1915; member of the Carroll County Medical Society and served as secretary-treasurer for several terms and as alternate delegate; aged 49; died of a heart attack February 14.

**Edward N. Gerard, M.D.**, Leonard, graduate of the University Medical College of Kansas City, 1895; member of the Shelby County Medical Society; aged 71; died February 16.

**Louis W. Schermann, M.D.**, St. Louis, graduate of the Homeopathic Medical College of Missouri, St. Louis, 1900; member of the St. Louis Medical Society; aged 62; died February 20.

**Julius Frischer, M.D.**, Kansas City, graduate of the University Medical College of Kansas City, 1905; honor member of Jackson County Medical Society; aged 56; died February 21.

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## NOVOCAIN HAS OTHER TREATMENT VALUES BESIDES THAT OF ANESTHETIC

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Procaine hydrochloride, commonly known as novocain, in addition to its value as a local anesthetic, has proved beneficial in the treatment of many disorders, especially acute injuries, Tom Outland, M.D., Harrisburg, Pa., and C. R. Hanlon, M.D., Sayre, Pa., point out in *The Journal of the American Medical Association* for April 6.

"Procaine treatment is of definite value in fractures which do not require correction and immobilization," they declare. Such fractures, in which severe injury to the ligaments is primary and the fracture itself of secondary importance, include those of the lumbar transverse processes (the projecting points on each side of the vertebrae of the loin region), fractures of the vertebral spines and fractures of the head of the radius (the bone on the outer side of the forearm).

Sprains and muscles and ligaments, muscle bruises, acute inflammation of the joints due to injury, and acute inflammation of a bursa (a saclike cavity filled with sticky fluid, situated in the tissues at a place where friction would otherwise develop) are other conditions in which the drug has been used with striking results. It has also given encouraging results in certain cases of arthritis and sciatica (inflammation of the nerve along the hip bone, attended with abnormal sensation along the thigh and leg).

In many of the cases cited by the authors a single injection was sufficient to cause prolonged relief of pain. They recommend that the patient be urged to move the injured part immediately after the injection.

Aside from its use as a treatment for injuries, procaine hydrochloride is advocated for various internal diseases, for disorders of the urinary tract, in eye, ear, nose and throat work, in dental surgery, in general surgery, in obstetrics and even in psychiatry.



## MISSOURI STATE MEDICAL ASSOCIATION

83rd Annual Meeting, Hotel Connor, Joplin

The 83rd Annual Session of the Association convenes at the Hotel Connor, Joplin, Monday, Tuesday and Wednesday, April 29, 30 and May 1, 1940.

### HOUSE OF DELEGATES

Roof, Hotel Connor

First Meeting—Monday, April 29, 1940—9:30 a. m.

#### Order of Business

Report of Committee on Credentials.  
Reading of Minutes of Previous Meeting. (Published in July 1939 JOURNAL.)  
Election of Speaker of House of Delegates.  
Election of Vice Speaker of House of Delegates.  
Reading of President's Message and Recommendations.  
Appointment of Reference Committees:  
    Amendments to Constitution and By-Laws.  
    Resolutions.  
    Miscellaneous Affairs.  
    Medical Education and Public Welfare.  
Report of General Committee on Arrangements: H. L. Kerr, Crane.  
Report of Local Committee on Arrangements: Paul W. Walker, Joplin.  
Report of the Secretary.  
Report of the Treasurer.  
Report of Committees:  
    Scientific Work: J. E. Stowers, Kansas City, Chairman.  
    Postgraduate: C. H. Neilson, St. Louis, Chairman.  
    Publication: Walter Baumgarten, St. Louis, Chairman.  
    Public Policy: Morris B. Simpson, Kansas City, Chairman.  
    Defense: Charles E. Hyndman, St. Louis, Chairman.  
    Medical Education and Hospitals: L. W. Dean, St. Louis, Chairman.  
    Cancer: Dudley A. Robnett, Columbia, Chairman.  
    Medical Economics: Carl F. Vohs, St. Louis, Chairman.  
    Mental Health: G. Wilse Robinson, Sr., Kansas City, Chairman.  
    Maternal Welfare and Infant Care: Ralph R. Wilson, Kansas City, Chairman.  
    Health and Public Instruction: A. R. McComas, Sturgeon, Chairman.  
    Constitution and By-Laws: Floyd H. Spencer, St. Joseph, Chairman.  
    Fractures: M. L. Klinefelter, St. Louis, Chairman.  
    Conservation of Eyesight: C. P. Dyer, St. Louis, Chairman.  
    Control of Venereal Disease: G. V. Stryker, St. Louis, Chairman.  
Report of Special Committees:  
    Physical Therapy: A. J. Kotkis, St. Louis, Chairman.  
    Study of Medical Practice Laws: Lee D. Cady, St. Louis, Chairman.  
    Tuberculosis: E. E. Glenn, Springfield, Chairman.  
    Industrial Health: E. C. Funsch, St. Louis, Chairman.  
    Rural Medicine: H. A. Lowe, Springfield, Chairman.  
Appointment of Committee on Nominations.  
Unfinished Business.

*Recess Until 4:30 p. m.—Empire Room*

Report of the Council: Dr. Curtis H. Lohr, St. Louis, Chairman.  
Report of Reference Committees:  
    Amendments to the Constitution and By-Laws.  
    Resolutions.  
    Miscellaneous Affairs.  
    Medical Education and Public Welfare.  
New Business (Resolutions, Memorials, etc.).  
Selection of Place of Next Meeting.

Second Meeting—Wednesday, May 1, 1940—4:00 p. m.

Report of Committee on Credentials.  
Reading of Minutes.  
Election of Officers:  
    Election of President-Elect.  
Report of Committee on Nominations.  
Report on Election of Councilors.  
Installation of President.  
Nominations for Standing Committees by President and Confirmation by House of Delegates.  
Unfinished Business. (Report of Reference Committees.)

## MATERNAL WELFARE COMMITTEE

## Annual Meeting

Monday, April 29, 1940—12:00 noon—Empire Room, Hotel Connor

Dr. Ralph R. Wilson, Kansas City, Chairman, Presiding

Selected Case Report of Maternal Death.

Questions submitted from the floor.

Critique of Report of Maternal Death and Discussion of Submitted

Questions ..... Dr. John W. Harris, Madison, Wisconsin

Closed meeting for physicians only. All members of the Association are invited to attend and participate in the discussion. Tickets for the luncheon may be purchased at the door.

## GENERAL MEETING

Monday, April 29, 1940—2:30 p. m.—Roof, Hotel Connor

2:30 p. m. Studies in Blood Coagulation Disturbances

—Heyworth N. Sanford, M.D., Chicago



Blood coagulation disturbances may be divided into two groups: those in which a defect in the blood clotting mechanism may be shown, and those in which no coagulation disturbance may be demonstrated. In the last group there is presumed to be a vascular defect. In the first group lowering of the prothrombin and quantitative and qualitative platelet defects will account for the majority of conditions. In the second group vitamin deficiencies and allergic disturbances are frequently found. A basis for classification of these coagulation disturbances is thus given; and from this appropriate tests may be made that will show what coagulation elements are deficient. The various means by which these deficient coagulation elements may be corrected is discussed.

3:10 p. m. Pain Relief in Labor ..... John W. Harris, M.D., Madison



The present day demand for pain relief in labor has reached such proportions that in many instances it has taxed the limits of safety for both mother and child. Stress is placed on the physiologic factors involved and the limitations of various procedures are noted. In the choice of pain relieving drugs, the patient herself, the environment in which the labor is conducted and, especially, the experience of the physician should be the determining factors.

3:50 p. m. Office and Hospital Management of Some Anorectal Disorders ..... Louis A. Buie, M.D., Rochester, Minnesota



Various factors of importance to be considered in making examinations of the anus and rectum will be discussed. This will be followed by a discussion of the diagnostic features and the medical and surgical treatment of such conditions as hemorrhoids, fissures, fistulas and other common anorectal diseases.

4:30 p. m. House of Delegates. Empire Room.



## DINNER IN HONOR OF PAST PRESIDENTS

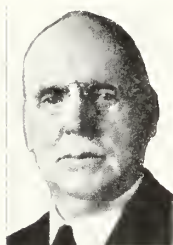
Monday, April 29—6:30 p. m.—Roof, Hotel Connor

Dr. James R. McVay, Kansas City, President, Presiding.

Tendered by Officers of the Association, Presidents and Secretaries of County Medical Societies, Members of the House of Delegates, Members of the Association and Their Ladies. Members of the Woman's Auxiliary and Visiting Guests Are Cordially Invited.

Remarks by the President, Dr. James R. McVay, Kansas City.

Introduction of Distinguished Guests.



Dr. Nathan B. Van Etten, New York,  
President-Elect, American Medical  
Association

An American Health Program

Introduction of Past Presidents.

Round Table Discussion: Problems in the Practice of Medicine.

Opened: "How We Think They Should Be Solved."

Dr. Curtis H. Lohr, St. Louis, Chairman of the Council.

Dr. Cyrus E. Burford, St. Louis, President-Elect.

Dr. Herbert L. Mantz, Kansas City, Adviser, Woman's Auxiliary.

Dr. Morris B. Simpson, Kansas City, Chairman, Committee on  
Public Policy.

Questions and Open Discussion.

Dinner is informal. Members are urgently requested to purchase tickets as early as possible on Monday, April 29, at Registration Desk, Mezzanine Floor, Hotel Connor, to facilitate the necessary arrangements. Those arriving late may purchase tickets at the entrance to the Banquet Hall after 6:00 p. m.

## GENERAL MEETING

Tuesday, April 30, 1940—8:30 a. m.—Roof, Hotel Connor



8:30 a. m. Address of the President.  
James R. McVay, M.D., Kansas City



8:50 a. m. Address of the President-Elect.  
Cyrus E. Burford, M.D., St. Louis

9:10 a. m. The Importance of Protein Replacement in the Treatment of Severe Burns . . . Robert Elman, M.D., St. Louis

Many lives are lost, especially in childhood, because of the general manifestations produced by severe cutaneous burns. This is especially unfortunate because many burns although extensive are not deep and never require skin grafting provided only that the patient can be carried through the acute stage of the injury. Evidence has been accumulated indicating that loss of protein is a serious if not the only factor responsible for the extremely serious general manifestations and death; it is probably also responsible for the lack of resistance which leads to infection. Treatment by replacement of the lost protein produces dramatic results and will save many lives. The mechanism and magnitude of the protein loss and its practical replacement will be discussed.

9:30 a. m. The Prognosis and Treatment of Hypertension

—Cyrus C. Sturgis, M.D., Ann Arbor

Patients with hypertension are divided into several groups as an aid in prognosis and treatment. The various causes of hypertension are discussed, methods of studying a patient are considered and a number of therapeutic agents including splanchnicectomy are evaluated. Special attention is given to the influence of certain psychic factors in the causation of hypertension.



10:00 a. m. The Role of the Female Urethra in Bladder Irritation in Women

—Alfred I. Folsom, M.D., Dallas, Texas

10:30 a. m. Advances in the Management of Diabetes

—Cyril M. MacBryde, M.D., St. Louis

10:50 a. m. Acute Suppurative Pleurisy

—Joseph W. Gale, M.D., Madison, Wisconsin

The treatment of empyema is based upon certain physiologic and fundamental principles which must be adhered to in order to achieve the best results. Once improper treatment has been instituted two dangers lie ahead: first, immediate death; or second, the production of a chronic process leading to invalidism. The patient then will have to have a radical operation with the extensive removal of the chest wall. There is no other surgical condition in which early proper care will be rewarded with such brilliant success, nor is there any other pathologic process which, when improperly treated, will be followed by a larger percentage of disappointing results.

11:20 a. m. A Study of Diabetic Patients Under Observation for Ten Years With Special Reference to Arteriosclerosis

—William H. Olmsted, M.D., St. Louis

### ROUND TABLE LUNCHEON

Tuesday, April 30, 1940—12:00 noon—Empire Room, Hotel Connor

Luncheon Meeting

Dr. R. M. James, Joplin, President, Jasper County Medical Society, Presiding

Surgery . . . . . Joseph W. Gale, M.D., Madison, Wisconsin

Internal Medicine . . . . . Cyrus C. Sturgis, M.D., Ann Arbor, Michigan

Urology . . . . . Alfred I. Folsom, M.D., Dallas, Texas

Questions and Answers on Addresses of Guest Speakers.





# GENERAL MEETING

Tuesday, April 30, 1940—2:00 p. m.—Roof, Hotel Connor

- 2:00 p.m. Some of the Hazards in the Treatment of Hyperthyroidism .....E. V. Mastin, M.D., St. Louis

Some of the difficulties in making a differential diagnosis between hyperthyroidism and some conditions that resemble it are discussed together with the most common complications that arise in the course of the disease, both preoperatively and postoperatively. In order that these hazards may be most accurately dealt with, it is recommended that patients be under the joint supervision of the internist and surgeon throughout the course of the disease. The indications for the graded or multiple stage operation are discussed together with the type of anesthetic that is best fitted to the individual patient. Suggestions are made concerning the difficulties of the operation itself.

- 2:20 p.m. Some Practical Considerations in the Treatment of Chronic Gonorrhea  
—Alfred I. Folsom, M.D., Dallas, Texas

- 2:50 p.m. Low Back Pain From the Orthopedic Point of View  
—Frank D. Dickson, M.D., Kansas City

- 3:10 p.m. The Anemias of Pregnancy  
—Cyrus C. Sturgis, M.D., Ann Arbor



In the last ten years a great deal of new information has been acquired regarding the anemias of pregnancy. Studies have shown that in general they may be divided into two main types; namely, macrocytic and microcytic anemia. Fifty-four per cent of routine admissions to the obstetrical department of the University Hospital, Ann Arbor, had a pathological anemia and 20 per cent of all pregnant women in a nearby county had a similar condition. The mechanism of the production of each type of anemia and effective methods of their treatment are discussed.

- 3:40 p.m. The Diagnosis of Pernicious Anemia  
—M. Pinson Neal, M.D., Columbia

Pernicious anemia need no longer be considered a malignant and fatal disease. Specific therapy is available and effective if instituted early and continued. This makes it incumbent upon the practitioner of medicine to recognize the condition promptly. The diagnostic criteria will be presented, evaluated and discussed.

- 4:00 p.m. The Dynamics of Respiration  
—Joseph W. Gale, M.D., Madison



The preoperative and postoperative disturbances in the dynamics of respiration are of the utmost importance to the surgeon. They may occur as the result of mechanical, chemical or bacteriological causes, or as a combination. The early recognition of these conditions permits correction through simple measures. If not diagnosed at its inception the condition may have progressed to a point at which treatment is unsatisfactory. A film will be shown to demonstrate the changes which occur in respiratory movements through the alteration of certain mechanical factors.

- 4:30 p.m. Heart Disease: Review of the Progress of a Decade  
—Julius Jensen, M.D., St. Louis

The advances of cardiology during the last decade, the growth of organizations for the study of cardiovascular problems, the growth and establishment of cardiological journals, the addition of general texts and special monographs to cardiological literature will be reviewed. Diagnostic measures, electrocardiographic, roentgenological and other technical advances in the study of cardiovascular phenomena, the changes in fundamental views on heart diseases, the value of the etiological basis for classification of heart disease, the advances made in the preventive and curative treatment of syphilitic, rheumatic and degenerative forms of heart disease will be considered. The advances in digitalis therapy, the early use of diuretics and the establishment of the superiority of the mercurial diuretics will be summarized and the methods of estimating surgical and obstetrical work, and the various surgical procedures for cardiovascular disease will be evaluated.

- 4:50 p. m. The Small Encephalogram  
—B. Landis Elliott, M.D., Kansas City
- 5:15 p. m. Alumni and Fraternity Meetings.
- 6:00 p. m. Cocktail Party. Stag. Hotel Connor. Jasper County Medical Society, Host.
- 7:00 p. m. Buffet Dinner and Entertainment. Stag. Roof, Hotel Connor. Jasper County Medical Society, Host.

## GENERAL MEETING

Wednesday, May 1, 1940—8:30 a. m.—Roof, Hotel Connor

- 8:30 a. m. The Application of Gynecological Endocrinology to General Practice . . . . . Paul F. Fletcher, M.D., St. Louis

The different types of gynecological conditions that are due either directly or indirectly to endocrine disturbances are presented with an analysis of clinical manifestations from a gynecological point of view. A classification of the various endocrine products available for use at the present time and the citation of clinical conditions in which their use is indicated is included. An evaluation of dosage and method of administration with a short summary of results that have been obtained are given.

- 8:50 a. m. Undulant Fever . . . Hubert M. Parker, M.D., Kansas City

- 9:10 a. m. Functional Menstrual Disturbances  
—Everett D. Plass, M.D., Iowa City



Menstrual disturbances, unassociated with gross evidence of pelvic disease, are largely of endocrine origin. Intelligent therapy depends upon a knowledge of the physiology of menstruation and of the effects to be expected from the various endocrine products available. The anterior pituitary gland evidently controls the function of the ovaries and is in turn controlled to some extent by the other endocrine glands. Abnormal menstruation apparently results from disturbances of this hormonal balance and therapy aims to restore the balance by substitution or by stimulation. Menorrhagia, dysmenorrhea and menopausal phenomena are usually amenable to treatment but amenorrhea is more difficult to control.

- 9:40 a. m. Food Allergy . . . . . Herbert J. Rinkel, M.D., Kansas City

The diagnostic accuracy of skin testing in various forms of atopic allergy will be considered. The experience of the last few years indicates that too much diagnostic reliability is generally given skin testing, particularly in the case of foods. An evaluation of the necessary factors in patients with food allergy are contrasted against the proved reliability of skin tests. A brief outline of the minimal necessary diagnostic procedures in addition to cutaneous tests are outlined and detailed.

- 10:00 a. m. The Importance of Water Balance and the Electrolytes in the Preoperative and Postoperative Care of Surgical Patients . . . . . George W. Post, M.D., Chicago



Water composes about 70 per cent of the body weight and the normal human adult requires about 2500 cc. for his daily needs. The main alkaline elements, sodium, potassium, calcium and magnesium, are also essential in the blood stream and are replaced normally only by food. The essential chlorine can be replaced by  $\text{HCO}_3$ . The maintenance of normal metabolism is dependent on the presence of sufficient quantities of these substances. After hemorrhage, operation or other depleting conditions, the balance between these is lost and must be restored if the individual is to recover. Persons who are critically ill and whose balance has been greatly disturbed require this balance to be restored quickly as a life saving measure. Those less critically disturbed are far more comfortable and recover more easily and rapidly if the measures at hand are promptly employed to restore this balance.

- 10:30 a. m. The Diagnosis of Renal Lesions—Ira H. Lockwood, M.D.,  
and Arthur B. Smith, M.D., Kansas City

Lesions of the kidney present many pitfalls in diagnosis. The clinical signs and symptoms are rarely pathognomonic. The interpretation of



the initial symptoms is frequently misleading. Nausea, vomiting, malaise, indefinite abdominal pain, loss of weight or strength, nocturia, frequency of urination, hematuria and fever are some of the presenting symptoms.

10:50 a.m. Treatment of Some of the Contagious Diseases

—John H. Musser, M.D., New Orleans

A review will be presented of the common acute contagious diseases seen on a large contagious disease service. Such diseases as scarlet fever, measles, erysipelas, meningitis, whooping cough and chickenpox will be discussed; particular reference will be made to the use of sulfanilamide preparations and some suggestions of minor moment concerning the handling of these disorders.

11:20 a.m. Treatment in the Anxiety States

—John M. Sartin, M.D., Springfield

The relation of increase in anxiety reactions to the threats to individual security and frustration of instinctual strivings present in our contemporary civilization is stressed. The nature of anxiety symptoms as expressions of autonomic imbalance, and their production of vicious cycles of worrisome thinking is emphasized. Treatment is discussed, including investigation of dynamic factors, formulation to patient, use of drugs and suggestion. The responsibility of the family physician in the care and treatment of these cases is urged.

ROUND TABLE LUNCHEON

Wednesday, May 1, 1940—12:00 noon—Empire Room, Hotel Connor  
Luncheon Meeting

Dr. H. A. Lowe, Springfield, Chairman, Committee on  
Rural Medicine, Presiding.

Surgery.....George W. Post, M.D., Chicago  
Internal Medicine.....John H. Musser, M.D., New Orleans  
Obstetrics and Gynecology.....Everett D. Plass, M.D., Iowa City  
Pediatrics .....John Aull, M.D., Kansas City  
Questions and Answers on Addresses of Guest Speakers.

GENERAL MEETING

Wednesday, May 1, 1940—2:00 p. m.—Roof, Hotel Connor

2:00 p. m. Surgical Management of Hyperinsulinism

—L. P. Engel, M.D., Kansas City

The presentation will consist of a discussion of the various causes of hypoglycemia and the differential diagnosis of hyperinsulinism; the indications for exploration of the pancreas in search of an islet cell adenoma; a detailed description of the technic for the removal of pancreatic adenomata for subtotal pancreatectomy.

2:20 p. m. Some Facts Concerning Coronary Vascular Diseases

—John H. Musser, M.D., New Orleans



The incidence, etiology and unusual expressions of coronary disease will be elaborated upon. There will be a résumé as well of the accepted forms of treatment applicable to coronary occlusion.

2:50 p. m. Intractable Asthma .....H. L. Alexander, M.D., St. Louis

Recently it has been emphasized that there is a great distinction between extrinsic and intrinsic asthma. The latter is identified by certain characteristics and it is this group that includes most patients with intractable asthma. The management of these patients includes measures for the immediate relief of attacks and general measures directed toward the disease itself. These, together with complications and prognosis, are discussed.

3:10 p. m. The Fibroid Uterus . . . . . Everett D. Plass, M.D., Iowa City  
 Uterine fibromyomata seemingly are related to menstruation in that they do not appear before puberty and rarely grow or produce symptoms after the menopause, but are increasingly common near the end of sexual life. These tumors may lead to menstrual disorders or may produce pressure symptoms by their size and position. During pregnancy they may acquire considerable significance. Various types of degeneration develop but malignant change is rare. Diagnosis is usually easy but may be more difficult in the presence of certain other pelvic lesions. Treatment depends upon the age of the patient and the desire for more children as well as upon the size and location of the tumors and the resulting symptoms.

4:00 p. m. House of Delegates.

5:00 p. m. Council.

## COMMERCIAL EXHIBITS

### Mezzanine Floor, Hotel Connor

#### LEA & FEBIGER, 600 WASHINGTON SQUARE, PHILADELPHIA. BOOTH 1.

Lea & Febiger are exhibiting new works and new editions. The new works include Adair's "Obstetrics and Gynecology," Packard's "Pneumothorax," Master's "Electrocardiogram of the Heart," Eller's "Tumors of the Skin," Schwartz' and Tulipan's "Occupational Diseases of the Skin," Clement's "Anesthesia," Hayden's "The Rectum and Colon," Carter, Green and Twiss' "Diseases of the Biliary Tract" and Witherspoon's "Gynecology." New editions of the following works are shown: Fishberg's "Hypertension," Printz and Greenbaum's "Diseases of the Mouth," Wiggers' "Physiology," Boyd's "Pathology of Internal Diseases," Park and Williams' "Pathogenic Microorganisms," Kanavel's "Infections of the Hand" and many others.

#### C. B. FLEET CO., 921 COMMERCE STREET, LYNCHBURG, VA. BOOTH 2.

Phospho-Soda (Fleet), a saline laxative which has been presented to the medical profession for over fifty years, is being displayed. This eliminant is suggested when a rapid nongripping action is desired. It is recommended in gallbladder disorders. The profession is cordially invited to visit the booth of C. B. Fleet Co.

#### HORLICK'S MALTED MILK CORPORATION, RACINE, WIS. BOOTH 3.

Nourishing, digestible, appetizing—these are the three outstanding qualities for which Horlick's is famous, whether in powder or tablet form. You will be interested in the many uses from infant feeding to old age. Note especially the convenience of the tablets in ulcer diets.

#### MEAD JOHNSON & COMPANY, EVANSVILLE, IND. BOOTH 4.

Mead Johnson & Company not only is exhibiting several new products but is showing various examples of their slogan "Servamus Fidem"—We Are Keeping The Faith.

#### LEDERLE LABORATORIES, 30 ROCKEFELLER PLAZA, NEW YORK. BOOTH 5.

Lederle Laboratories' exhibit is featuring the latest on management of the pneumonias—Sulfapyridine, Sodium Sulfapyridine and Anti-Pneumococcic Sera of which all types (31 in all) are available. Also literature and information is available on such items as Solution Liver Extract, Allergy, Digitalis, Globulin Modified Antitoxins (Scarlet Fever, Staphylococcus, Gas Gangrene), Vitamin B Complex (Emulsion, Capsules and Parenteral), Bellabulgara Tablets for Parkinson's Disease. Mr. J. G. Rea and Mr. G. D. Doyle are in charge of the exhibit.

#### THE BORDEN COMPANY, 350 MADISON AVE., NEW YORK. BOOTH 6.

A visit to the Borden booth will acquaint the physician with the unique virtues of Biolac, today's outstanding liquid infant food which enables the artificially fed baby to enjoy both nutritional and digestional advantages of the breast-fed infant. Also exhibited are Dryco, Beta Lactose, Klim, Merrill-Soule Products and Borden's Irradiated Evaporated Milks.

#### ELI LILLY AND COMPANY, INDIANAPOLIS, IND. BOOTH 7.

Eli Lilly and Company produced the first commercial preparation of insulin, contributed to development of liver therapy and has been responsible for many other therapeutic advancements. Information concerning all Lilly products is available at the Lilly exhibit where Merthiolate (Sodium Ethyl Mercuri Thio-salicylate, Lilly), Sodium Amytal (Sodium Iso-Amyl Ethyl Barbiturate, Lilly) and other important products are being featured.

#### GRADWOHL LABORATORIES, 3514 LUCAS AVE., ST. LOUIS. BOOTH 8.

The latest methods of blood typing and identification of blood spots, proofs of paternity by blood grouping methods and identification of human blood using reagents of exceptional value are being shown. Demonstrations will be made by request. Complete line of laboratory reagents for hospitals and private physicians are being shown, together with methods of teaching laboratory technic.

#### MCINTOSH ELECTRICAL CORPORATION, 223 N. CALIFORNIA AVE., CHICAGO. BOOTH 9.

Old customers and friends of the McIntosh Electrical Corporation will find a welcome in Booth 9. The new No. 8870 Brevatherm with the improved air-spaced electrodes and arms, with elbows affording extreme flexibility of adjustment for every conceivable mode of application and also the new McIntosh No. 1518 Sinustat low-voltage generator are being exhibited. Biolite infra-red lamps and accessories are being displayed. Mr. Paul Read is in charge of the exhibit and will greet the many physicians whom he has served.



MEDICAL PROTECTIVE COMPANY, WHEATON, ILL. BOOTH 10.

The Medical Protective Company invites you to call at their booth. Medical Protective Service is an institution of the medical profession whose legal liability problems we have concentrated upon for forty-one years. Bring your professional liability questions to our representative who is at your service to present our protection plan, to explain the peculiar relation of the doctor to the law which governs your practice or to discuss any particular phase of professional liability in which you are especially interested.

MERCK & CO., INC., RAHWAY, N. J. BOOTH 11.

The display at the Merck booth is featuring the following: Vinethene, an inhalation anesthetic agent especially useful for short operative procedures when rapid, easy induction and prompt recovery are desired; it produces adequate relaxation and postoperative nausea and vomiting are rare. Thiamin Chloride (pure crystalline vitamin B<sub>1</sub>), specific for "the beriberi heart" and associated conditions due to thiamin deficiency. All physicians are cordially invited to visit the Merck booth where Mr. A. W. Veazey is in attendance.

SMITH, KLINE & FRENCH LABORATORIES, 105 N. 5TH ST., PHILADELPHIA. BOOTH 12.

Smith, Kline & French Laboratories, believing that many physicians dislike efforts to make them register, have arranged their booth for self-service. Up-to-date information about Benzedrine Inhaler, Benzedrine Sulfate, Benzedrine Solution, Pentnucleotide, Feosol Tablets and Elixir, Oxo-ate "B," Eskay's Neuro Phosphates and Paredrine Hydrobromide with Boric Acid Ophthalmic may be obtained in convenient envelopes from literature dispensers. If additional data is desired, the representative will be glad to answer any questions.

PHILIP MORRIS & CO., LTD., 119 FIFTH AVE., NEW YORK. BOOTH 13.

Philip Morris & Company are demonstrating the method by which it was found that Philip Morris Cigarettes, in which diethylene glycol is used as the hygroscopic agent, are less irritating than other cigarettes. Their representative will be happy to discuss researches on this subject and problems on the physiological effects of smoking.

HAMILTON-SCHMIDT SURGICAL COMPANY, 215 N. 10TH ST., ST. LOUIS. BOOTH 14.

The Hamilton-Schmidt Surgical Company exhibit is in charge of the Missouri representative, Mr. Frank Ritzen, who will demonstrate some new Burdick Physio-Therapy equipment, the Cutters Dextrose Intravenous solution and also some new instruments made by the Stille Co. of Sweden.

PEVELY DAIRY COMPANY, 1001 S. GRAND, ST. LOUIS. BOOTH 15.

Pevely Dairy Company is exhibiting their Council Accepted Evaporated Milk. The use of evaporated milk has been quite universally adopted in infant feeding and has done a great deal to simplify dietary problems. It is always uniform in composition, easy to prepare and its economic cost is a great added feature.

SCHERING CORPORATION, BLOOMFIELD, N. J. BOOTH 16.

Schering Corporation's representatives will be pleased to discuss latest developments in hormone therapy. New products on display are Cortate (desoxycorticosterone acetate), Anteron (gonadotropic hormone from mares' serum), Pran-turon (gonadotropic hormone from pregnancy urine), Pranone (orally effective progestin) as well as the other well known Schering preparations, Progynon-B, Progynon-DH, Proluton, Oreton and Neo-Iopax.

THE COCA-COLA COMPANY, ATLANTA, GA. BOOTH 17.

The Coca-Cola Company is serving Coca-Cola complimentary to members attending the Session.

JOHN WYETH & BROTHER, 1118 WASHINGTON AVE., PHILADELPHIA. BOOTH 18.

All physicians are cordially invited to visit this booth where the following specialties are on display: Amphojel, Wyeth's Alumina Gel for the treatment of hyperacidity and peptic ulcer; Kaomagma, Wyeth's Magma of Alumina and Kaolin for the treatment of diarrhea and colitis; Alulotion, Ammoniated Mercury with Kaolin for the treatment of impetigo contagiosa; Bepron, Wyeth's Beef Liver with Iron for the nutritional anemias; Mucara, for the treatment of constipation; Bewon Elixir, the palatable appetite stimulant and vehicle; Silver Picrate, for the convenient treatment of trichomonas vaginalis and acute anterior urethritis.

A. S. ALOE COMPANY, 1813 OLIVE ST., ST. LOUIS. BOOTH 19.

The A. S. Aloe Company, St. Louis and Kansas City, are featuring the entirely new Washington University Model Portable Obstetrical Table. This table is being introduced and demonstrated by representatives of the University. In addition, the Aloe Company is showing new developments in instruments and interesting miniature models of their famous Steeline Treatment Room Equipment.

M. & R. DIETETIC LABORATORIES, INC., 585 CLEVELAND AVE., COLUMBUS, OHIO. BOOTH 20.

Similac, a food for infants deprived of breast milk, is being exhibited. Representatives are present to explain the merits of Similac in normal as well as difficult feeding cases.

WESTINGHOUSE X-RAY COMPANY, INC., 410 PROFESSIONAL BLDG., KANSAS CITY, MO. BOOTH 21.

Westinghouse X-Ray Company is exhibiting for the first time in the Middle West the new Simplex Unit. This unit is the latest development in high powered shock-proof diagnostic equipment for both vertical and horizontal fluoroscopic and radiographic work. It is economical in its space requirement and economical in price.

## COUNCILOR DISTRICT AND SOCIETY PROCEEDINGS

### COUNTY SOCIETY HONOR ROLL FOR 1940

(UNDER THIS HEAD WE LIST SOCIETIES WHICH HAVE  
PAID DUES FOR ALL THEIR MEMBERS)

#### HONOR ROLL

Chariton County Medical Society, December 5, 1939.

Perry County Medical Society, December 11, 1939.

Camden County Medical Society, December 18, 1939.

Miller County Medical Society, December 20, 1939.

Ste. Genevieve County Medical Society, December 22, 1939.

Clinton County Medical Society, December 23, 1939.

Moniteau County Medical Society, January 8, 1940.

Macon County Medical Society, January 10, 1940.

Dent County Medical Society, January 29, 1940.

Dallas-Hickory-Polk County Medical Society, February 15, 1940.

Barry County Medical Society, February 22, 1940.

Andrain County Medical Society, March 22, 1940.

Webster County Medical Society, March 25, 1940.

Morgan County Medical Society, April 8, 1940.

DeKalb County Medical Society, April 15, 1940.

Newton County Medical Society, April 15, 1940.

C. Manning, Skidmore; Charles W. Kirk, Hopkins; Charles D. Humbert, Barnard; Eugene Crowson, Pickering; P. J. Ross, Grant City; Samuel E. Simpson, Stanberry; Charles T. and Emmett B. Settle, Rock Port; Henry F. Bauman, Fairfax; John Davis, Charles H. Flynn, Claude D. Haskell and Clifton M. Waugh, Tarkio. Guests present were Drs. Harry S. Conrad, L. P. Forgrave, Jacob Kulowski, Irwin I. Rosenthal and Floyd H. Spencer, St. Joseph; A. S. Bristow, Princeton; R. D. Schrock and G. R. Dornberger, Omaha; J. F. Waugh, Chicago, and Ed and Jesse Miller, dentists, Maryville.

Dr. W. R. Galeota of the public policy committee reported on the meeting of presidents and secretaries held in Jefferson City, March 10, and the State Association's plans for legislation pertinent to organized medicine.

The president reported the death of Dr. A. C. Long, Sheridan, on March 28, after an illness of several months. On motion of Dr. Emmett B. Settle, the secretary was instructed to write an informal letter of sympathy to Dr. Long's widow and son, expressing the Society's condolences.

Dr. Settle as chairman of the program committee reported that the scientific program for the meeting of May 6, the final meeting before the summer interim, will be furnished by Dr. Peter T. Bohan, Kansas City, on some phase of focal infection arthritis.

Dr. Samuel E. Simpson, Stanberry, was elected delegate from Gentry County and Dr. W. T. Martin, Albany, alternate. Dr. P. J. Ross, Grant City, was elected delegate from Worth County and Dr. John Andrews, Grant City, alternate.

Dr. Robert D. Schrock, Omaha, Professor of Orthopedic Surgery, University of Nebraska College of Medicine, gave a clinical lecture on "Colles' Fracture and Its Management." He gave a careful review of the anatomy of the wrist and the lower forearm and an exposition of his routine of reduction and immobilization. Discussion was by Drs. Kulowski, Egley, Settle and Forgrave.

Dr. J. F. Waugh, Chicago, of the Department of Dermatology of Rush Medical College, presented a short discussion of "Skin Cancers," emphasizing epitheliomas, keratotic areas and horny and scaly excrescences, particularly those occurring about the nose, lips and ears. His choice of routine treatment for these conditions is fulguration. Secondary to this he uses carbon dioxide snow and the roentgen ray.

Dr. A. S. Bristow, Princeton, Councilor of the First District, expressed his pleasure in attending the meeting and spoke briefly of planned legislation in the coming session of the Missouri State Legislature.

CHARLES D. HUMBERD, M.D., Secretary.

ASSOCIATE EDITORS: COUNCILORS OF THE  
TEN COUNCILOR DISTRICTS

#### FIRST COUNCILOR DISTRICT

A. S. BRISTOW, PRINCETON, COUNCILOR

Nodaway-Atchison-Gentry-Worth Counties  
Medical Society

The Nodaway-Atchison-Gentry-Worth Counties Medical Society met April 1 at the Linville Hotel, Maryville. The president, Dr. Clifton M. Waugh, Tarkio, called the meeting to order at 7:30 p. m. after a Dutch treat dinner.

Members present were Drs. Francis R. Anthony, Charles T. Bell, J. A. Bloomer, Carlos E. Cossins, Loren E. Egley, William R. Galeota, William R. Jackson, Robert C. Person and William M. Wallis, Jr., Maryville; Benjamin F. Byland, Burlington Junction; Joseph

#### FOURTH COUNCILOR DISTRICT

R. B. DENNY, CREVE COEUR, COUNCILOR

St. Louis County Medical Society

The St. Louis County Medical Society met March 27 at 8:30 p. m., at the Nurses' Home of the St. Louis County Hospital, Clayton. Dr. Julius Jensen, St. Louis, president, called the meeting to order.

Dr. Hollis N. Allen, St. Louis, opened a pathological conference by presenting an extremely large heart for study and discussion.

Dr. Alphonse McMahon, St. Louis, who had been attending physician on the case to be discussed and had observed the patient for several years, gave the following case history:

Man, aged 43, sufferer from cardiac asthma, had had a number of breaks in compensation and had a bad gallbladder. Blood pressure was from 170 to 190. Extraction of teeth reduced blood pressure twenty points. He was dyspnoeic day and night and had frequent digestive upsets. Later, patient developed severe pre-



cordial pains. Pulse was 120. Upon hospitalization, with cardiac fibrillation, he had moisture at base of both lungs. Within forty-eight hours systolic pressure dropped to 100, there was no fever, white count was 13,000, sedimentation 13, 45 and 65. Morphine, Spasalgin and Aminophyllin to relieve pain were given. Diagnosis was posterior infarct. Patient was found dead in bed.

Dr. Allen said the heart was enormous in size, right ventricle dilated and blue in color, evidence of infarcts and thrombi, posterior left ventricle necrotic, circumflex artery opened and no coronary occlusion or arteriosclerosis. A posterior left ventricle infarct showed healed after episode four years previously.

Dr. McMahon said Aminophyllin and glucose used to relieve pain are definitely analgesic and coronary dilating. It works well with various combinations with Salyrgan or Mercupurin in congestive heart failure and has a distinct place in emergencies; acts well in coronary thrombosis and infarct. When given intravenously rapidly it gives a feeling of warmth, redness of face and neck and increases the breathing cycle for a few moments.

It was concluded that one can have coronary infarction without coronary disease since there was no coronary disease present. Marked hypertrophy was present. Other points brought out were that the larger the heart the slower is the beat; vascular bed does not go along with hypertrophy; capillary bed was not increased; the coronary flow depends upon the length of the diastole; the systole pulls the muscular contractions down and squeezes out the coronaries; short diastole increases the rate, lessens nutrition; lessened circulation produces atrophy of the muscle; there are tremendous infarcts in cardiac decompensation.

Discussion was by Drs. R. A. Nussbaum, J. D. Hayward, Julius Jensen, M. A. McLoon and Philip Schuck.

In closing Dr. McMahon pointed out that Aminophyllin used with Salyrgan, when diuretics are indicated and in edemas and certain hepatic diseases, is from 80 to 90 per cent absorbed in an hour; it produces myocardial tone, relieves dyspnea, cardiac asthma and Cheyne-Stokes breathing; increases venous pressure. Aminophyllin is given in doses of from 9 to 15 grains daily. One injection at noon and one at bedtime usually gives the patient a restful night. The coronary flow is definitely improved. This Theobromine derivative definitely improves angina pectoris. Calcium Acetate Theophyllin assists in healing the infarct scar, reduces the size of the scar and induces the return of contractility. There is a difference of opinion as to the effects of Aminophyllin given by mouth. Tracings were studied and effects noted after Aminophyllin injected intravenously in three, six, ten, twenty and thirty minutes. There was less precordial distress, some blood pressures increased and some decreased. Vascular alterations were noted in the myocardium.

The president asked for a full report on the "Dr. Harvey Mudd Memorial" at Kirkwood from Drs. E. B. Waters and R. C. McLean at the next meeting of the Society.

Thirty-five members attended the meeting.

L. A. MENDONSA, M.D., Secretary.

#### FIFTH COUNCILOR DISTRICT

WILLIAM A. BLOOM, FAYETTE, COUNCILOR

##### Cooper County Medical Society

The Cooper County Medical Society met at St. Joseph's Hospital, Boonville, March 27.

The following officers were elected: President, Dr. G. L. Chamberlain, New Franklin; vice-president, Dr. C. H. Van Ravenswaay, Boonville; secretary, Dr. J. C. Tinch, Boonville; delegate, Dr. W. H. Ziegler, Boon-

ville; alternate, Dr. Arie C. Van Ravenswaay, Boonville.

Those present at the meeting were Drs. W. E. Stone, Arie C. Van Ravenswaay, W. H. Ziegler, Aubrey H. Wells, Alex. Van Ravenswaay, G. W. Winn, T. C. Beckett, M. S. McGuire, J. C. Tinch, Boonville; G. L. Chamberlain, New Franklin; Charles Sandy, Pilot Grove; W. H. Elliott and R. G. Kelly, Bunceton; A. L. Meredith, Prairie Home, and Thomas J. Kelly, Jefferson City.

J. C. TINCER, M.D., Secretary.

#### EIGHTH COUNCILOR DISTRICT

H. L. KERR, CRANE, COUNCILOR

##### Dallas-Hickory-Polk County Medical Society

The Dallas-Hickory-Polk County Medical Society met at 3:30 p. m., April 2 at the office of Dr. L. A. Glasco, Urbana. The following were present: Drs. V. H. Greenwood, R. E. Harrell, G. C. Plummer, Buffalo; C. H. Brown, Fairplay; T. R. Wrinkle, Halfway; L. A. Glasco, Urbana; Robert Vinyard and F. R. Farthing, Springfield.

Section 1, paragraph 2 of the resolution adopted concerning care of the clients of the Farm Security Administration was amended to read as follows: "Eligibility, Doctors.—All legally licensed medical doctors who are members of their county society and State Medical Association and who are approved by the Dallas-Hickory-Polk County Medical Society shall be eligible to serve these families and be paid from fund set up under this plan."

Dr. C. H. Brown, Fairplay, reported on the meeting in Jefferson City of presidents and secretaries of societies.

Dr. F. R. Farthing, Springfield, spoke on "Some Problems of Surgical Abdominal Diagnosis," bringing out that it is best to allow the patient to talk freely before being questioned; that laboratory examination should follow complete history and physical examination which should be thorough; the roentgen ray is more important than test meals; from 3 to 4 per cent of stomach ulcers become cancer; patient with acute gall-bladder disease should not be operated on; more than 50 per cent of hospital admissions for acute abdominal disease are for appendicitis.

Dr. Robert Vinyard, Springfield, discussed "Present Status of Prostatic Surgery," stating that mortality is now 5 per cent as compared to 40 or 60 per cent under the one stage method. Cases for punch and straight resection must be carefully selected.

Dinner was served at the Killingsworth Cafe at 7:00 p. m.

The next meeting will be at Wheatland, May 7.

R. E. HARRELL, M.D., Secretary.

##### Newton County Medical Society

The Newton County Medical Society met March 21.

The following officers were elected: President, Dr. M. C. Bowman, Neosho; vice president, Dr. L. E. Rolens, Granby; secretary-treasurer, Dr. John A. Guthrie, Neosho; delegate, Dr. M. C. Bowman, Neosho; alternate, Dr. L. E. Rolens, Granby.

Caring for the clients of the Farm Security Administration was discussed and much opposition was expressed to the fee rate specified. No action was taken.

J. A. GUTHRIE, M.D., Secretary.

#### NINTH COUNCILOR DISTRICT

ELDON C. BOHRER, WEST PLAINS, COUNCILOR

##### South Central Counties Medical Society

The South Central Counties Medical Society met at the Horton Hotel, Willow Springs, March 14, at 6:00 p. m. Dr. R. M. Norman, Ava, presided.

The following members and guests were present: Drs. P. D. Gum, A. H. Thornburgh, J. W. Bingham, West Plains; H. G. Frame, A. C. Ames, Mountain Grove; H. B. Hull, Mammoth Springs, Arkansas; L. M. Dillman, Houston; J. A. Fuson, Mansfield; Garrett Hogg, Cabool; R. M. Norman, Ava; Murray C. Stone, H. B. Hovey, Springfield; R. H. Ray, C. F. Callihan, Willow Springs.

Dr. Murray C. Stone, Springfield, gave a clinical-pathological presentation followed by a round table discussion.

Dr. H. B. Hovey, Springfield, gave a brief talk on "Criminology."

Following a report by the secretary on the meeting of presidents and secretaries of county medical societies in Jefferson City, March 10, there was a round table discussion on proposed legislation.

The next meeting will be held at Cabool, April 11.

C. F. CALLIHAN, M.D., Secretary.

### TENTH COUNCILOR DISTRICT

#### E. J. NIENSTEDT, SIKESTON, COUNCILOR

##### Cape Girardeau County Medical Society

The Cape Girardeau County Medical Society held a joint meeting with the Southeast Missouri Dental Society at Cape Girardeau, March 11, on the hundredth anniversary of the founding of the first dental college in America.

Physicians present were Drs. J. B. Costen, St. Louis; J. Lee Harwell, D. C. Hoxie, B. J. Macauley, B. K. Flanery, Poplar Bluff; M. G. Anderson, Sikeston; Claude D. Holder, Hayti; D. I. L. Seabaugh, A. M. Estes, Jackson; Edward Crites, Sedgewickville; W. J. Benner, Leon J. May, Anna, Illinois; M. H. Shelby, D. H. Hope, G. W. Walker, W. F. Oehler, D. B. Elrod, G. J. Tygett, Frank W. Hall, H. L. Cunningham, W. H. Wescoat, C. T. Herbert and C. A. W. Zimmermann, Cape Girardeau. Dentists present were Drs. C. B. Coleman, Theodore Robb, W. J. Allen, L. F. Bates, A. L. Bower, Poplar Bluff; L. O. Wicecarver, Malden; M. M. Jones, Campbell; J. C. Mills, Kennett; D. L. Mowery, Jackson; L. S. Bunch, R. W. Rixman, H. F. Baumstark, J. A. Rapp, V. P. Grisham, and A. J. Rasche, Cape Girardeau.

Dr. C. B. Coleman, Poplar Bluff, read a synopsis of a paper on "One Hundred Years of Dentistry in America."

Dr. J. B. Costen, St. Louis, spoke on "Sources of Abnormal Pain About the Head, Simulating Sinus Pain and Other Neuralgias," illustrated with lantern slides.

Because no business was transacted at this meeting a special meeting was called for March 15 at 8:00 p. m.

#### Meeting of March 15

The Cape Girardeau County Medical Society met at a called meeting on March 15.

Medical service outlined by the Farm Security Administration for the indigent families under its care was discussed and correspondence read. The Society agreed to cooperate with the program. Mr. Joe Smith of the Cape County Savings Bank, Jackson, was named as trustee. A medical advisory committee to the Administration was appointed as follows: Dr. D. I. L. Seabaugh, chairman, Dr. E. R. Schoen and Dr. Albert Estes, Jackson. The committee is to supervise all medical bills.

The Society went on record as approving the National Physicians' Committee.

The report of the secretary, Dr. C. A. W. Zimmermann, Cape Girardeau, on the meeting of presidents and secretaries of county societies at Jefferson City, March 10, was read as follows:

"The president and secretary of the Cape Girardeau County Medical Society attended the meeting. One hundred three presidents and secretaries were seated

for the dinner the Association furnished those attending.

"Following the dinner, Dr. James R. McVay, Kansas City, President, opened the meeting with an address in which he urged unifying our resources in the defense of the best health interests of our state. He suggested that the present meeting be divided, the officers of the Association presenting their views first.

"Dr. Cyrus E. Burford, St. Louis, President-Elect, emphasized that we were interested in the profession for one thing and the people for another. Heretofore, ethics had prevented the profession from publicizing its principles; yet, if propaganda is defined as disseminating knowledge useful and beneficial to the people it is a virtue to use propaganda.

"Dr. Curtis H. Lohr, St. Louis, Chairman of the Council, pointed out that since councilors are elected by the delegates and delegates are smaller in number, the organization is better represented because attendance is proportionately larger. He recounted a number of accomplishments by the councilors and stressed the favorable situation in the cancer hospital. He stated that none but cancer cases are accepted and if any of these are not indigent, the fault lies in the district from which they are recommended.

"Mr. E. H. Bartelsmeyer, St. Louis, Executive Secretary, spoke of the Annual Session to be held in Joplin, April 29, 30 and May 1, and said the public would estimate the interest of the profession by the attendance and urged full attendance. He said there would be ten prominent out-of-state speakers; past Presidents would be honored at a dinner; the Jasper County Medical Society would be hosts at a stag party and entertainment.

"Dr. S. A. Grantham, Joplin, in behalf of the Jasper County Medical Society, extended an invitation to attend the Joplin Session to all members and urged that this meeting be a rally to professionalism.

"Dr. W. A. Bloom, Fayette, Councilor of the Fifth District, and Dr. Howard B. Goodrich, Hannibal, Councilor of the Second District, invited members to meetings of their respective districts.

"On motion of Dr. H. S. Langsdorf, St. Louis, a telegram was sent to Dr. A. H. Hamel, St. Louis, congratulating him on the fiftieth anniversary in the practice of medicine.

"Dr. Harry F. Parker, Jefferson City, State Health Commissioner, spoke on the relation of doctors to the public and the State Board of Health to the profession.

"Dr. E. H. Skinner, Kansas City, praised the efforts of the National Physicians' Committee for the Extension of Medical Service, explaining its worthiness and necessity as an adjunct to the American Medical Association and told of the requirements for funds for its maintenance and urged every physician to make some contribution. He urged the cementing of relationship between physicians and the public and recommended enlightening each patient by his physician as to the necessity of noninterference by the government.

"Dr. Morris Simpson, Kansas City, Chairman of the Committee on Public Policy, discussed the activity of his Committee. It was announced that further consideration of the matters under discussion had been planned at the dinner meeting to be held on the evening of the first day of the Joplin Session, April 29."

The report was favorably received and was ordered filed with the minutes.

C. J. HERBERT, M.D., Secretary Pro Tem.

#### Perry County Medical Society

An open meeting of the Perry County Medical Society was called to order by the president, Dr. O. A. Carron, Perryville, March 12, at 8:15 p. m. at Dr. Carron's office.



All regular physicians of Perry County were invited to attend.

The medical care plan for Farm Security Administration families in Perry County was discussed in detail by all present. It was decided to adopt the plan for one year providing that at least seventy-five families are signed up and that no obstetrical care be provided to families signing after the original plan is established unless the care is required ten months after the family has signed up. It was suggested that settlement of fees be made at the end of the year instead of quarterly and that some member of a local bank be made trustee of the fund.

Physicians present were Drs. O. A. Carron, B. T. Koon, J. J. Bredall, W. H. Bailey, W. H. Barks and S. E. Peden, Perryville, and Theodore Fischer, Altenburg.

J. J. BREDALL, M.D., Secretary.

#### St. Francois-Iron-Madison-Washington-Reynolds County Medical Society

The St. Francois-Iron-Madison-Washington-Reynolds County Medical Society met March 29 at the St. Francois County Courthouse, Farmington, at 7:30 p. m.

Dr. Raymond O. Muether, St. Louis, discussed "Vitamins," laying particular stress on the practical application in every day practice. Numerous questions were asked and an enthusiastic discussion followed.

The cancer control program was endorsed and a vote of thanks given Mrs. D. S. Long, Harrisonville, leader, for her effort and excellent accomplishment.

Dr. N. W. Hawkins, Bonne Terre, reported in detail on the meeting of presidents and secretaries of societies in Jefferson City, March 10, calling attention to the definite program of the State Association and the optimistic attitude of those present.

The following officers were elected: President, Dr. P. L. Jones, Flat River; vice president, Dr. W. H. Barron, Fredericktown; secretary-treasurer, Dr. G. Tivis Graves, Jr., Farmington, reelected; delegates (Madison) Dr. W. H. Barron, Fredericktown, alternate, Dr. Harold Frieheit, Fredericktown; (Washington) Dr. John P. Yeargain, Irondale; (Reynolds) Dr. James R. Pyrtle, Centerville, alternate, Dr. Joseph L. Thurman, Potosi; (Iron) Dr. R. E. Harland, Ironton, alternate, Dr. Ben M. Bull, Ironton; (St. Francois) Dr. Emmett F. Hocter, Farmington, alternate, Dr. Reuben Appleberry, Farmington.

G. TIVIS GRAVES, M.D., Secretary.

#### Six County Medical Society

The Six County Medical Society met at the Dunn Hotel, Poplar Bluff, on March 21, for a dinner meeting.

Dr. Howard Rusk, St. Louis, presented a paper on "Undulant Fever."

Dr. Bruce Kenamore, St. Louis, spoke on "The Use of the Gastroscope," illustrated by lantern slides.

Dr. E. J. Nienstedt, Sikeston, Councilor, spoke on the need of cooperation between physicians and legislators as to future bills before the general assembly.

Dr. F. L. Kneibert, Poplar Bluff, was elected secretary for the ensuing year.

The following members were present: Drs. H. M. Hendrickson, B. J. Macauley, H. S. Clay, A. F. Brookreson, J. Lee Harwell, William Spaulding, C. L. Qualls, A. R. Rowe, F. L. Kneibert, J. Lester Harwell, Poplar Bluff; Paul Baldwin, U. A. V. Presnell, T. R. Presnell, Kennett; C. H. Jones, Piedmont; A. P. Aquino, J. B. Luten, Caruthersville; H. E. White, Naylor; E. J. Nienstedt, Sikeston; Thelma Cotton Buckthorpe, Van Buren; S. E. Mitchell, Malden.

L. E. COOPER, M.D., Secretary.

## WOMAN'S AUXILIARY

### WOMAN'S AUXILIARY TO THE AMERICAN MEDICAL ASSOCIATION

18th Annual Meeting, New York

President, Mrs. Rollo K. Packard, Chicago.

### WOMAN'S AUXILIARY TO THE MISSOURI STATE MEDICAL ASSOCIATION

16th Annual Meeting, Joplin

President, Mrs. Paul F. Cole, Springfield.

President-Elect, Mrs. Stanley P. Howard, Jefferson City.

Adviser, Dr. Herbert L. Mantz, Kansas City.

#### Tentative Program

##### Monday, April 29

6:30 p. m. Dinner in Honor of Past Presidents of the Missouri State Medical Association. Dr. Nathan B. Van Etten, New York, President-Elect, American Medical Association, speaker. Roof, Hotel Connor.

##### Tuesday, April 30

8:30 a. m. Registration.  
10:00 a. m. Meeting of executive board, Mrs. Paul F. Cole, Springfield, presiding. Scottish Rite Cathedral. Members are welcome.  
12:30 p. m. Luncheon at the Woman's Club (50 cents). Rev. Cliff Titus, Joplin, speaker.  
3:00 p. m. to 5:00 p. m. Tea and Musical Program. Scottish Rite Cathedral. Wives of members of Jasper County Medical Society, hostesses.  
7:00 p. m. Dinner, Mrs. Charles T. Reid, Joplin, presiding. Empire Room, Hotel Connor (\$1.25).

##### Wednesday, May 1

8:00 a. m. Registration.  
9:00 a. m. General meeting, Scottish Rite Cathedral, Mrs. Paul F. Cole, Springfield, presiding. Address of Welcome, Mrs. Charles T. Reid, Joplin. Response, Mrs. C. T. Ryland, Lexington. Business session: Reports of officers, committee chairmen, resolutions, elections. Memorial service.  
1:00 p. m. Annual Auxiliary Luncheon, Sagmount Hotel. Mrs. Paul F. Cole, Springfield, presiding (75 cents).  
Guest speakers: Dr. James R. McVay, Kansas City, President, Missouri State Medical Association; Dr. Cyrus E. Burford, St. Louis, President-Elect, Missouri State Medical Association; Dr. Herbert L. Mantz, Kansas City, Adviser, Woman's Auxiliary.  
3:00 p. m. Post Convention Board meeting, Mrs. Stanley P. Howard, Jefferson City, presiding.

Missouri rejoices in the success of the national *Hygeia* contest. The Buchanan County Auxiliary won first place in its class (with memberships from 43 to 600) and three honorable mentions of sixteen awarded went to Cape Girardeau County, Mrs. A. M. Estes, Jackson, chairman; Jackson County, Mrs. Ralph Myers, Kansas City, chairman; Lafayette County, Mrs. C. T. Ryland, Lexington, chairman. Mrs. A. M. Estes, Jackson, was state *Hygeia* chairman and Mrs. C. H. Werner, St. Joseph, chairman of Buchanan County. Missouri increased its *Hygeia* subscriptions from 642 to 797.

The sympathy of the Missouri Auxiliary is extended to Mrs. Samuel Clark Red, Houston, Texas, on the death of Dr. Red. Mrs. Red served as the first national president, was a guest of the Missouri Auxiliary at the convention in Excelsior Springs in 1935 and has attended many national conventions.

Mrs. Frank L. Davis, St. Louis, chairman of the program committee, reports that fourteen auxiliaries responded to a letter requesting reports on health programs given. Most of them have held monthly meetings with outstanding leaders and speakers. There have been seventy-one health programs. Subjects which have been most popular are "Influence of Medicine on Present Day Living," "The Common Cold," "Syphilis and the State Laws Controlling It," "The Activities of the League of Nations on International Health," "What's New in Social Hygiene and the Maternal Health Bill," "Local Health Opportunities and Needs," "Cancer, Its Treatment and Cure," "Mental Health and Modern Treatment," "National Health Problem," "A Citizen Looks at Public Health," "Popular Beliefs That Are Not So," "Skins You Love to Retouch," "The School Child and His Health." Judging from the reports, much interest has been manifested in public health needs and there is a growing interest in presenting information to the laity which should be of help to the community as well as to the medical profession.

## BOOK REVIEWS

A TEXTBOOK OF LABORATORY DIAGNOSIS. With Clinical Applications for Practitioners and Students. By Edwin E. Osgood, M.A., M.D., Associate Professor of Medicine, University of Oregon Medical School, etc. Third edition. With twenty-seven figures in the text and ten colored plates. Philadelphia. The Blakiston Company. 1940. Price \$6.00.

To many the new edition of this now well established text will be welcomed as a rejuvenation of an old friend. The book has been thoroughly revised and many additions have been made. Methods for the determination of sulfanilamide, vitamin C, vitamin K, alcohol and many others appear for the first time.

The chapter on hematology which has always been excellent has been improved as a result of the author's experience with his hematology atlas.

Perhaps not the least of the book's value rests on the author's ability to omit those tests and procedures which do not contribute much to our search for clinical truths.

To me, Osgood's text has always been first class and the third edition surpasses the previous editions. I regret that the author continues to divide his book into two sections, the first on interpretation, the second on methods. In my teaching this seems to have a distinct disadvantage. The disadvantage is not sufficient, however, to detract materially from the inherent value of the book and to the practitioner the arrangement may actually be advantageous.

R. O. M.

THE STORY OF SURGERY. By Harvey Graham. With a foreword by Oliver St. John Gogarty. New York: Doubleday, Doran & Company, Inc. 1939. Price \$3.75.

Harvey Graham is reputed to be the pseudonym for I. H. Flack, a physician who lives somewhere in Great Britain. This reviewer has neither the time nor the inclination to follow up the veiled clue to find further information concerning the author but agrees with Oliver

St. John Gogarty, who provided the foreword, that "This book is not a textbook."

The most dramatic incidents in the history of surgery are presented in great detail and English medicine of the past is emphasized in many places, while the discoveries of other countries are sometimes dismissed with a mere mention. One example of this is found on page 324, where Crawford W. Long is given only a portion of a short paragraph.

In the bibliography of sixty-five references, mostly by British writers, there is an absence of such names as Gurlt, Sprengel, Haeser, Darenberg, Baas, Pagel, Gross, Hirsch and Packard. Nevertheless, it is an interesting survey of the progress of surgery from prehistoric and ancient periods to the present day from which the well informed historian still can find many instructive statements. Although primarily intended for the laity, it is worthy of a place in the libraries of modern surgeons of undoubted professional attainments.

The splendid index of names and that of subjects enhance the value of the work for reference purposes.

R. E. S.

CIVILIZATION AGAINST CANCER. By Clarence Cook Little, ScD. New York, Toronto. Farrar and Rhinehart, Inc. 1939. Price \$1.50.

As a contrasting situation, it seems particularly interesting to review a book upon cancer when the emotional thoughts of the nation are centered upon infantile paralysis. The contrast rests in the facts presented by Little that cancer is killing each year just fifteen times as many people as is infantile paralysis and that the American public contributes just one tenth as much to cancer propaganda as to infantile paralysis. These multiply to 150 times as much public interest in infantile paralysis as cancer control. There is something illogical about this contrast in interest and contribution to control of health hazards.

There is another phase of this contrasting situation that seems to have escaped notice. There is a progressive increase in those who live to a greater age level and therefore there are more and more who reach the years when cancer displays its ravages. Even with the great increase in cancer research, pathological diagnosis and more efficient surgery and radiation therapy (all of which Little describes for the layman's education and appreciation) there still remains the primary necessity of getting suspected cancer patients to proper diagnosis and treatment early. This element of suspicion must be developed in the family doctor.

It might be a good experiment to insist that every applicant for old age security submit to a physical examination for cardiac, renal and cancer symptoms. We require children about to enter school to show a record of a physical survey and immunization. Why not apply the same technic at other age levels?

Little points out that the pioneer spirit is useful in attacking the cancer problem. There are many avenues of approach to educate the people and the physicians in the importance of cancer interest. One of the best of the newer methods is the development of the Women's Field Army which functions through the Federation of Women's Clubs of the United States. With such a large percentage of visible, accessible cancer in the female and the undeniable fact that the only hope for reducing the mortality is by early recognition and prompt treatment, this becomes a practical approach to educational control. This book will serve as a fine textbook for the Women's Field Army.

But the fact remains that the death rate and the crippling handicaps through life from infantile paralysis do have an emotional appeal that far outstrips that which cancer provides. There are far more mothers who die each year from cancer of the uterus than children who die or are crippled by infantile paralysis. The



mother appeal must be capitalized on to infuse emotion into action. All advertisers know the value of appealing to the child motif. It remains for some enterprising committee to think out a mother appeal that will stir the nation into effective action for cancer control.

E. H. S.

**EXPERIMENTAL PHARMACOLOGY AND MATERIA MEDICA.** By Dennis E. Jackson, Ph.D., M.D., F.I.C.A., Cincinnati, Ohio, Professor of Pharmacology, Materia Medica, and Therapeutics in the University of Cincinnati College of Medicine, etc. Second Edition. With 892 illustrations including fifty-five color plates. St. Louis: The C. V. Mosby Company. 1939. Price \$10.00.

This book of 900 pages is divided into three parts, pharmacology, shop work, and materia medica and prescription writing.

The portion on pharmacology is 635 pages long and is written and planned as an experimental pharmacology to be used especially by students of medicine and pharmacy. This book is definitely a book of experiments. The answers are not given and all that it tells is how an experiment should be carried out. From the diagrams a physician could obtain the answers to the actions of many of the drugs that are considered. This section on experimental pharmacology is interesting because it is a review. Many questions are brought up and many experiments worked that a physician would not realize were carried on, such as the use of the ophthalmoscope on a frog, the sympathetic innervation of organs, the action of drugs on the sympathetic nervous system, the vasomotor sectioning of nerves showing especially the dilatation of the blood vessels in the ear of a rabbit and the arrangement of many interesting pieces of apparatus.

The second part devoted to shop work illustrates how a great number of mechanical things used in pharmacology and physiology are made. In this portion photography is included. It not only shows how many different types of pictures are taken but also shows how to develop the films and how to make copies of them.

In part three devoted to materia medica and prescription writing are included exercises in prescription writing, posology, Latin, incompatibility, solubility and Latin to English and English to Latin vocabulary.

I would say that this is a very complete book and any physician who wishes to do any kind of experimental work on animals could get a great number of ideas from it.

J. C.

**FRACTURES.** By Paul B. Magnuson, M.D., F.A.C.S., Associate Professor of Surgery, Northwestern University Medical School, Attending Surgeon, Passavant Memorial Hospital and Wesley Memorial Hospital, Chicago. 317 illustrations. Third edition, revised and enlarged. Philadelphia, Montreal, London: J. B. Lippincott Company. 1939. Price \$5.00.

Only in recent years has the treatment of fractures merited a volume to itself. The subject developed from a humble sideline in surgical practice to a major activity in highly specialized endeavors. The immediate result has been a mass of detail in fracture literature requiring oversized volumes containing, too often, conflicting opinions.

Magnuson's third edition is essentially the personal experience of a man in the diversified field of traumatic conditions. Credit is given and reference made to others working in the same field. However, the author simplifies the treatment for the reader by describing the technic found most satisfactory in his own observation, thus eliminating confusing ideas.

The author states his purpose to be the presentation of fracture problems from the standpoint of the man first seeing the injury. He hopes to secure for the fracture patient first aid and preliminary treatment so care-

fully planned that he will ultimately have the optimum result whether secondary care is by the first attendant or by another surgeon. Emphasis is laid upon industrial injuries and the requirements for rehabilitation of damaged bones and limbs of industrial employees.

The chapter on injuries to the hand is particularly enlightening with its elaboration of the care of small bone injuries. The author makes it clear in another chapter that skeletal fixation of fractured hips and skeletal traction of fractured shafts are his own preference in treatment. Skin traction is carefully described for those who lack facilities for the more accurate and effective skeletal methods. Injuries of the spine and spinal cord receive careful analysis and consideration. The reviewer heartily agrees that closed reduction of fractures and dislocations of the cervical spine is the method of choice in the large majority of cases with this serious type of injury.

Details of pathology and treatment are so clearly stated that the surgeon will be helped in giving adequate attention to the majority of fractures occurring in his practice. On the other hand, complications and frequent ill results are sufficiently emphasized that no honest surgeon will presume to undertake the care of fractures for which he has not the armamentarium or in which he lacks the necessary experience.

Two chapters on physical therapy and exercise stress the importance of these phases of fracture treatment. Recommended equipment is simple and directions for its use are explicit. In addition, appropriate physical therapy is mentioned in the detailed aftercare of individual fractures. This is refreshing to those who have seen the serious neglect of this essential feature of fracture convalescence.

The volume is moderately priced and is a convenient size for handling. Illustrations are clear, the paper is good and the author's literary style is easy to follow and understand. While details of elaborate surgical procedures are not included, fracture surgeons of wide experience will find much of refreshment and usefulness in its 511 pages and 317 illustrations.

T. P. B.

**PRACTICAL OBSTETRICS.** By Brooke Bland, M.D., Emeritus Professor of Obstetrics, Jefferson Medical College; Consulting Obstetrician, Jefferson Medical College Hospital, Philadelphia, Pa., and Thaddeus L. Montgomery, M.D., Clinical Professor of Obstetrics, Jefferson Medical College, Philadelphia, Pa. Third revised edition. Illustrated with 502 engravings including twenty-seven colored plates. Philadelphia: F. A. Davis Company, Publishers. 1939. Price \$8.00.

This volume can be used well for teaching purposes since it covers the field of obstetrical work briefly but adequately. The authors begin with a comprehensive discussion of the anatomy and physiology of pregnancy and this phase of pregnancy should precede any other contents of an obstetrical book. They explain clearly certain physiological phenomena occurring in normal pregnancy.

The handling of the differential diagnosis of pregnancy is excellent and is arranged in chart form so that it can be more easily grasped. This is also true of the differential diagnosis of ectopic pregnancy.

The authors stress the use of abdominal examination, during labor since much information can be obtained from this type of examination without the attendant danger of infection.

The portion of the book which deals with operative obstetrics discusses only the more common methods of handling various obstetrical difficulties and covers these in sufficient detail. This book is well illustrated, and while brief, nevertheless, covers the major points well.

The last chapter on obstetrical jurisprudence is particularly well adapted to the present day tempo. Too little attention is given to obstetrical jurisprudence and the writers stress the necessity of every obstetrician be-

ing familiar with the laws of his state on certain points. In conclusion, they quote the too true statement that "The doctor should always believe the reproductive organs of the woman and not her words."

The authors deal excellently with various subjects such as impotence, sterility, virginity, hermaphroditism, rape, medico-legal aspects of pregnancy and abortion and infanticide. H. B. L.

**NITROUS OXIDE-OXYGEN ANESTHESIA.** McKesson-Clement Viewpoint and Technique. By F. W. Clement, M.D., Director of Anesthesia at Flower Hospital, The State Hospital for the Insane, Lucas County Hospital, etc., Toledo, Ohio. Illustrated with 70 engravings. Philadelphia: Lea & Febiger. 1939. Price \$4.00.

"Nitrous Oxide-Oxygen Anesthesia" by F. W. Clement, M.D., is a thorough, concise and well written text that should be read by every anesthetist who professes to be up to the minute in anesthesia literature. Anyone interested in problems of respiration who does not have the opportunity to read Holdane's work on respiration will find this book a handy guide when complex problems of respiration arise.

The book is divided into six parts; the first four parts cover completely the field of nitrous oxide-oxygen anesthesia and can be understood readily by any medical student. Chapter IX is classical and anyone interested in respiration and anesthesia will never forget the fundamental principles of cyanosis and anoxemia once he has read this section. This particular section impressed me most because it is the first time I have read anything referring to cyanosis and anoxemia that was explained so clearly and accurately. All sections of this book are written simply, avoiding all unnecessary elaboration but giving complete references if one desires to go further into any of the discussions.

The book gives in 268 pages what formerly would have required the reading of several books to obtain the same amount of information. It has boiled down everything that has to do with nitrous oxide-oxygen and its administration. References are given to various other newer anesthetic agents. A complete explanation with illustrations on interbracheal technic is given. References from such books as Beecher's "Physiology of Anesthesia," Guedel's "Inhalation Anesthesia," and Holdanes "Respiration" are made constantly.

This book is an up to the minute volume quoting references to work done in 1939. Any progressive anesthetist should consider it a pleasure to read such a readable and informative book on gas anesthesia. W. C. S.

**GASTROINTESTINAL DYSFUNCTION.** By Barton Arthur Rhinehart, A.B. (Zoology), M.D., Cum Laude (Indiana) A.O.A., Associate Professor of Roentgenology, University of Arkansas School of Medicine; Consulting Roentgenologist to St. Vincent's Infirmary, Arkansas Baptist Hospital, and Arkansas Children's Hospital; Roentgenologist, Little Rock General Hospital; Member Radiological Society of North America. With 48 plates. Little Rock, Arkansas: Central Printing Company. 1939.

This book could, in reality, be considered a prolonged monograph on dysfunctions of the gastrointestinal tract. It contains an excellent and exhaustive review of the literature as well as the quotations of many writers. A voluminous bibliography of over three hundred authors is well selected.

In Dr. Rhinehart's own series of fifteen hundred patients with gastrointestinal complaints, and in those series reported by others, about one third of the patients were found to be suffering from functional neurosis with no organic lesions present. It was also found that people who reside in the open are almost entirely free from the alimentary disorders so common in the urban

peoples of civilized countries. On the other hand mucous colitis occurs in people whose activities keep them confined. He states that "The preponderance of opinion as to the cause of the various conditions of the alimentary canal, which are known as gastric neurosis, mucous colitis, simple colitis, spastic colitis, etc., seems to favor the idea that the symptoms and findings encountered are local manifestations of a general condition involving the entire body. Dietary and vitaminic deficiencies have been shown to be responsible for many functional changes in the gastrointestinal tract. Many controlled experiments and many clinical observations have shown that the increased irritability exhibited by these patients is in the nature of a tetany, and that many of the degenerative and infectious tissue changes are results of nutritional deficiencies."

Sherman and Bernheim are quoted as saying "calcium deficiency is the most prevalent dietary deficiency in America," and since tetany can occur with calcium deficiency (Meakins, Roberts) cases of nutritional or latent tetany must be common.

In the diagnosis of a parathyroprivic tetany the Erb's sign, because of the increased electrical excitability of the motor nerves to the galvanic (direct) current, is the most positive sign of the disease. This test is used almost routinely by the author in the examination of his neurotic or functionally disordered patients.

Treatment has been directed toward the elimination of the tetanic state by dietary, medicinal and nutritional methods. The diet includes those foods with a high calcium content such as milk, cheese and sea foods. This diet is augmented by intensive vitamin D therapy. Sun baths and irradiation by ultraviolet rays are recommended as additional sources of the vitamin.

Personally, I have had the opportunity of trying this method on a few cases of irritable colon and have been well pleased with the results. While I cannot become quite so enthusiastic perhaps as the author, I do believe it is a rational line of therapy and may prove of real benefit.

I feel quite indebted to Dr. Rhinehart for his excellent review of the literature and his own research on this subject. D. A. W.

**INTERNAL MEDICINE.** Its Theory and Practice in Contributions by American Authors. Edited by John H. Musser, B.S., M.D., F.A.C.P., Professor of Medicine in the Tulane University of Louisiana School of Medicine; Senior Visiting Physician to the Charity Hospital, New Orleans, Louisiana. Third edition, thoroughly revised. Illustrated. Philadelphia: Lea & Febiger. 1938. Price \$10.00.

This text brings out the important features of medicine in a manner that is practical for the medical students who should know the basic facts of disease. It also stresses the modern viewpoint of various types of organic disease for the benefit of doctors who are in general practice. The contributors are all teachers and most of them are practicing medicine in the clinic and home.

There have been many changes in medicine the last four years which this book incorporates. Some of the important changes include a new section on Haverill fever, considerable changes in the section on influenza, new material on furunculosis, streptococcus meningitis, concepts of the treatment of pneumonia as well as the treatment of streptococcus infection.

The section on diseases of the heart discusses the carotid sinus reflex, aneurism of the heart, surgical treatment of angina pectoris and prognosis of various types of heart diseases.

The section on the alimentary tract has new material on gastroscopy, syndrome of recurrent hiatus hernia, disorders of the duodenum, regional enteritis, peritoneal tuberculosis and many other new features have been added in this edition. P. M.



# THE JOURNAL

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### THE CHALLENGE ACCEPTED

ADDRESS OF THE PRESIDENT

JAMES R. McVAY, M.D.

KANSAS CITY, MO.

In making a Presidential Address, may I ask your permission to digress from the stereotyped formula of a review of scientific medical progress of the last year and speak to you directly as a fellow member of the Missouri State Medical Association and as an individual practitioner of medicine interested in the welfare of our fellowmen?

Last year at this time I reviewed some of the principal objections to Senate Bill 1620 or the Wagner Bill. Among these objections were the stupendous cost to the taxpayers of the proposed legislation, the fact that the medical and dental professions had not been consulted in the formation of the bill and that it paved the way for an easy adoption by the states of a system of compulsory health insurance. After extensive hearings before the Senate Committee on Education and Labor in the 76th Congress and a preliminary report by the chairman of the subcommittee, Senator Murray, action on the bill has lapsed. In the minds of many the legislation was dead. I read editorials which stated that Americans need no longer fear such legislation. Neither the writers nor their readers reckoned with the forces that were behind this legislation nor the motives which guided their zeal.

Shortly after the convening of the second session of the 76th Congress, there was introduced Senate Bill 3230 known as the Wagner-George-Lea Bill to Promote the National Health and Welfare Through the Appropriation of Funds for the Construction of Hospitals. Its sponsors were Senator Wagner of New York and Senator George of Georgia. In the House of Representatives, Representative Lea of California introduced the companion bill known as H. R. 8240. These bills were introduced after a special message from the President sent to the Congress on January 30.

In conformity with the recommendations of the President, the bills provided for an initial appropriation of \$10,000,000 for the fiscal year ending June 30, 1941, and for each fiscal year thereafter such sums as the Congress may deem necessary. The sums are to be appropriated to the Public Health Service and the location of the hospitals is to be designated by the Surgeon-General of that service. An advisory committee is authorized, consisting of six members, who shall be leading medical or scientific authorities outstanding in experience in hospitals or other public services. After the location of the hospital has been decided upon they are to be constructed by the Federal Works Agency. The building then is to be leased to the state, county, city or other political subdivision for an undetermined period and the lease may be terminated by the Surgeon-General on six months' notice. Hearings on this bill were begun before the subcommittee on Education and Labor on March 18.

From this simple recital of the origin and purpose of the bill, no particular exception can be taken other than the impression that it appears to attempt to accomplish by indirection on a small scale what the Wagner Bill sought to accomplish by direct action, the establishment of a federal bureaucratically controlled health service.

Before the committee, its experimental nature was emphasized. One social service worker, a witness before the committee, described the proposed original appropriation as "a mere pittance." Those engaged in medical research to benefit mankind, who have expended both their time and money to carry on their work, I am sure would not like the designation of \$10,000,000 as a preliminary and an unlimited appropriation in the future as "a mere pittance." There was considerable variation in the estimates of the per bed cost of the institutions to be erected and from the testimony one feels that they would be considerably higher than expected. But regardless of the initial cost, regardless of ownership or direction, the paramount need of a hospital that is to give adequate medical service is the efficient staffing of that hospital. The bill makes no provision to safeguard this and until this feature

has been considered the principal problem will not be met. As has been the case in previous similar legislation there is no provision for aiding in the additional construction to hospitals already operating and serving the public but under private ownership. If they desire to participate then they must be deeded over to some political subdivision which is the only authority authorized to lease the institution from the government.

I sincerely urge all members to familiarize themselves thoroughly with the provisions of this bill so that they may decide intelligently whether this experiment will inure to the good health and well-being of their patients if such a hospital were established in their community. Is it more hospital beds that are needed or is it some provision whereby the beds already available may be occupied by those in need of hospital service but unable to pay for it?

Senator Mead of New York has introduced Senate Bill 3246 which proposes an appropriation of \$300,000,000 of which \$100,000,000 is to be earmarked for loans to hospitals. With a general national average bed occupancy of approximately 63 per cent, the need is not so much for additional construction as it is to provide means for making the beds available to those in need. There also has been introduced into the Congress Senate Bill 3660 by Senator Capper of Kansas. This bill is sponsored by Abraham Epstein, secretary for the American Society for Social Security. It presents all the objectionable features of a bill introduced under similar sponsorship in previous sessions of the Congress.

Such legislation as reviewed I consider a challenge to the medical profession. How is that challenge to be met? In my opinion it is to be met by the American Medical Association, by the Missouri State Medical Association and by the individual members, the practicing physicians.

The Officers and Trustees of the American Medical Association, cognizant of their position as the official representatives of 116,000 American physicians, have given their answer in "The Platform of the American Medical Association." The eight planks of this platform represent the only sensible solution to the problem of adequate medical care. They have been arrived at after mature deliberation by men whose lives are epitomes of unselfish devotion to the well-being of their fellowmen. Legislation based upon these principles will preserve the American way of medicine as surely as the Declaration of Independence preserved the freedom of American citizens.

During the last year the officers have attempted to make the Missouri State Medical Association a positive force in the medical thought of the commonwealth. They have sponsored and will continue to urge a legislative program which will bring Missouri from an unenviable position near the bottom of the list of backward states to a posi-

tion of leadership in the field of progressive medical legislation. The Basic Science Law, the Annual Medical Registration Act, a New Medical Practice Act and the Injunction Act are the beginnings of an awakened medical profession. The enactment of these laws will give the medical profession of Missouri preeminence among the states of the nation.

I have shown how the American Medical Association and the Missouri State Medical Association have accepted this challenge to American medical democracy. What is to be the answer of the individual practicing physician?

A few years ago the American public was astounded by the news reports of the indictment of the American medical profession in the Federal District Court of the District of Columbia. The American press reacted with countless editorials defending the altruism of the medical profession. What have we as individuals done to refute these unjust accusations?

For eighty-three years the individual membership of the Missouri State Medical Association has represented the highest ideals in unselfish service to the community and to the individual citizenry of any of the great professions. If the public has lost sight of these self sacrificing efforts for their welfare then it should be our individual duty to re-establish our profession in their esteem. Each member should consecrate himself to intelligent civic responsibility and by his devotion to the general welfare of his community resecure for himself and his profession the respect and admiration that has been rightfully enjoyed by the members of the profession since the time of Hippocrates.

814 Medical Arts Building.

#### PROSTIGMINE IMPROVES MANY DISORDERS CAUSED BY FAULTY CIRCULATION

The drug prostigmine is an effective addition to the treatment of circulatory disturbances of the extremities in which spasms of the blood vessels are present, Samuel Perlow, M.D., Chicago, reports in *The Journal of the American Medical Association* for May 18.

The drug gave moderate or marked relief to twenty of thirty-one patients with such conditions as gangrene of the leg, hardening of the arteries, blueness of hands and feet, acute obstruction of arteries of the legs, and Raynaud's disease (a progressive nervous disorder characterized by attacks of coldness or excitement, congestion of the small blood vessels and swelling; it may eventually result in gangrene).

Prostigmine acts by expanding the affected surface blood vessels, thus releasing their spasm. In the cases in which such spasm was the main cause of disturbance, relief continued as long as prostigmine was administered and recurred when it was stopped. However, in the more severe cases involving complete blocking of a blood vessel, as by a blood clot, improvement in the accessory circulation apparently developed when the spasm of the vessels was relieved, and the relief obtained continued after the drug was discontinued.



## THE RESPONSIBILITY OF MEDICAL CARE

ADDRESS OF THE PRESIDENT-ELECT

C. E. BURFORD, M.D.

ST. LOUIS

In receiving the high honor of serving as President of the Missouri State Medical Association a feeling of true appreciation comes over me accompanied by a deep sense of responsibility; one that I cannot meet successfully alone. Frequent meetings the last year with the councillors, presidents and secretaries of the various county societies, some of the Committees and the President, have convinced me that they have the true interest of the Association in their hearts and the business well in hand to continue the forward movement which all have observed the last few years.

Judging from the patient treatment accorded me by these gentlemen I am sure they are all familiar with Osler's quotation of an Arabian proverb: "He that knows not, and knows not that he knows not, is a fool, shun him. He that knows not, and knows that he knows not, is simple, teach him." It seems significant that I have in no wise been shunned by these gentlemen during the last year. I shall continue to seek their advice in the knowledge that their cooperation and support is the expression of the medical profession of Missouri.

With the enormous amount of new medical knowledge that has been developed by the profession in the last two decades it has become increasingly difficult to impart this vast heritage to the overburdened medical student within the allotted ten or twelve years of his training. It seems reasonable and it may be true that there has been scant time to teach him enough about the philosophy of life, his relationship to society as a teacher of good health and sound morals and the proper ethical relationship with his own confreres. How can one be a good doctor without the ability to influence people to safeguard their health, and how can one be a good citizen without using his influence for better government?

The state legislature will convene in January and matters of public health will come before that body. It is the duty of the profession to do all it can to preserve the public health and protect the sick by both medical and legislative means.

The profession asks for no special privileges but only for greater opportunities to prevent disease and to minister to the sick and afflicted in a broader and more effective manner.

The physician has been trained through succeeding centuries to think of the public and his patient with a sense of personal responsibility so that it becomes a part of his character, a sacred care. This habit of thought compels him to use his best efforts to save the life of a wounded gangster although he

despises his thinking and his acts. He will attend the child of ungrateful parents who carelessly spend their money for everything but medical care.

The medical profession does not ask for praise but only that it be permitted to proceed with the present arrangement of personal relationship between the doctor and the patient, the doctor doing the charity work which has been his right and heritage since the beginning of medical history and which has proven so fruitful in relieving the sick poor and in the tremendous advancement in the science of healing. The indigent sick is our ward.

When society has failed to provide for his economic needs, when his neighbors have given him scant food, the doctor has heard his midnight call for help and has given him freely not only of his medical skill but, of far greater value, he has mortgaged his own heart beats and has infused them with the very spirit of God himself that his patient might have renewed life.

The doctor's greatest joy never has been in securing an adequate fee in personal gratitude or in money, but in placing together the broken bits of humanity that nature might heal them. I have no fear that the doctors' interests and efforts toward the sick will continue on a high plain under the present free social system; but there seems to be good reason to fear that certain false philosophy of life may creep through the unguarded gates of the profession while the light of democracy flickers low. In the bright light of time and careful analysis these intruders would shrink into insignificance but under the cloak of beneficence they have misled the public and have bought the birthright of a few doctors for a mess of pottage.

State medicine, the soft sounding sophistry of prepayment medical care, should not be permitted to divide the ranks of the profession but should stimulate it to study together the far reaching effects of these innovations in countries where they have ceased to be an experiment, then stand unitedly for the things that will bring the greatest good to the sick.

The profession is willing to stand or fall as a profession by the standard of the best service to the sick in body, in mind and in soul; but it is our sacred duty as the only trained and experienced experts on this subject to have a big voice in the arrangement by which it is done.

The loud voice of the politician would distract the public, and it now behooves the profession to speak with votes, the only voice heard by the political adventurer who would gain personal prestige at the expense of the afflicted. I call upon the Missouri State Medical Association to present an unbroken front against all subversive forces in order that this beloved country of ours may continue to be the leader of all nations in the advancement of the Science and Art of Medicine in its service to all the people.

## THE CEREBRAL SYNDROME

LELAND B. ALFORD, M.D.

ST. LOUIS

Present ideas of the preeminence of the cerebral cortex depend mostly upon inference and not upon direct demonstration. Indeed, no cortical syndrome of a higher order such as Broca's aphasia, frontal lobe syndrome, agnosia or apraxia, even after a hundred years of intensive investigation has yet been established finally. Always closer scrutiny reveals that there are exceptions to the rule, that clinical pictures are not constant and clear-cut but, on the contrary, are variable and rather general and that similar pictures are produced from different points to such an extent that there is now a prevalent view that localization is not "strict."

Further, the mental state in cortical lesions as now interpreted presents an unsolved paradox. On the one hand, the further deficiencies are studied the more numerous and extensive they are found to be and new syndromes are described almost monthly; on the other hand, as the adequacy of the mental state is further investigated the more complete and excellent it appears. Thus Head insists repeatedly that "general intelligence" in aphasia is typically excellent and Weisenburg concludes: "As the majority of authors since Broca have maintained, the clear-cut aphasic patient does not show a general diminution of intelligence." To reconcile these contradictory aspects, some hypothesize a hand of general intelligence with fingers of special concepts and memories as for vision, hearing and motor speech, and Head concludes that it is the symbolic activities that are picked out for destruction. Neither is an alluring possibility.

Obviously the whole subject of cortical function needs a reconstruction from the foundation up. My solution is that the cortex and immediately underlying structures serve no important functions above the motor-sensory level. If this contention appear radical, it must still be evident that when added years of research have only served to increase confusion, as Henschen reminds us, we should be prepared for surprises.

The obvious question that arises is why, if the cortex serves no higher functions, injuries in the cortical area so often cause disturbances of speech and mentation. The answer is that two variable and interacting factors are prone to intervene and complicate matters. These factors are, first, the tendency for physical reactions to develop in the cerebral tissues around and often for some distance away from the actual, visible lesion; and, second, which investigators have generally failed to grasp, the peculiar tendency of the mind to develop instability before it is affected qualitatively or even quantitatively to any extent. These are factors that have to be weighed and balanced against the

other forces present through the whole gamut of cortical disturbances before final conclusions can be reached.

That the cortical lesion may exert its effects far beyond its boundaries was exhaustively considered by von Monakow a generation ago and with more data at hand there seems to be something still to be said on the subject. The innocent-appearing cyst of softening, for example, may affect functions far away and even the surgical excision, although evidently less harmful than spontaneous injuries, is often not without confusing effects, while tumor growths are rarely of any importance whatever except occasionally in a negative sense. This being true, the normal condition with lesions of any given area obviously takes precedence over abnormal manifestations, for the latter may be produced not by the original lesion but by a complication. This appears to be a logical enough conclusion but has been almost completely ignored by investigators.

The second complication, the mental instability which develops so readily from all sorts of causes originating outside as well as within the brain and mental as well as physiological in nature, serves to make the mental involvement seem more marked than it basically is. Once understood, this clarifies many seeming contradictions; for one instance, the paradox just mentioned. That this conception is a valid one seems upon investigation sufficiently obvious; indeed one alert to it can fairly see instability in action in actual cases and in reported case histories. If the patient fails at one time and succeeds at another with the same or no more difficult problems, one begins to suspect this instability. It is clearly a much more common sense conception than the "hand" and symbolic-level theories. Thus several of Head's patients chose reading for a pastime, although they were markedly deficient upon many simple but tricky tests; and one of my patients, who in daily life directed extensive banking and farming interests, did poorly with the rather simple tests put to him. It seems obvious that failure comes when there is an especial or unwonted stress on concentration, endurance or emotional control.

Conclusions as to a sectional mental defect seem to have been reached quite hastily by many investigators. When does normal variability, variability from fatigue and emotional strain and variability accompanying illness or brain injury reach a point at which we can conclude that a part of the mental mechanism is missing? Can anyone definitely say? If the patient reads for pastime or directs business affairs, can any considerable faculties be wanting from his mind? One would be inclined to say "no." Again if the deficiency is found to affect many tasks, one should likely conclude that the involvement is general and not sectional at all. In this case, if the term "defect" is used or implied, it should be understood in what sense it is used.

Let us see how some of the supposed cortical syn-

Substance of a paper given before the St. Louis Medical Society, February 21, 1939.



dromes can be interpreted under this new approach.

*Broca's Aphasia.*—From the very first, exceptions to this finding have been reported and Dandy describes two cases in which Broca's area was removed surgically with return of speech in about a month. These contradictory findings would be explained as dependent upon the degree of edema affecting the projection fibers that supply the organs of speech, which lie adjacent to Broca's area (causing dysarthria), and with the extent to which this handicap reacts upon the unstable mentality. It is the case of a mentality without force trying to overcome the difficulty offered by each word spoken and the result is a succession of failures, successes and partial failures, which are the combination that makes up this type of aphasia. The exceptions referred to are thus easily accounted for as being cases in which for some reason the reaction in surrounding tissues was minimal or absent, or the mentality happened to be little affected, or both.

The so-called subcortical motor aphasia is believed to be a hysteria-like defense reaction in which the mentality surrenders before the handicap of the dysarthria. Cases of sudden recovery and of recovery through training are on record. The setting, too, suggests hysteria, that is, excellent function up to a certain point and beyond that point complete loss of function. The retention of a stereotyped phrase also suggests a hysterical trick. The result should perhaps be regarded on the whole as an advantageous one since thereby mental confusion and emotional distress are avoided.

A defect of internal speech is given as another feature of aphasia and means a lack of the precise mental conception of the words being spoken. Now, with a markedly unstable mentality, the handicap of the dysarthria might instantly, by reflection, cause a mild confusion and loss of mental grasp that would come and go almost coincidentally with efforts to speak.

Anomia or defective ability to recall names has been designated as a variety of aphasia with the obvious implication that it represents a sectional psychic loss. But the name unlike other parts of speech does not usually permit substitution and paraphrasing and consequently its loss interrupts speech; and moreover its recollection requires a specific concentration. So anomia may be only the conspicuous part of a general weakness or instability. This appears the more probable when one sees that there is no logic to the names uncalled; at one moment a particular name may be recalled and an instant later be forgotten or familiar names may be missed and less familiar ones caught. Finally the severity of the condition generally improves rather rapidly and soon it becomes of no great practical significance. The unstable, neurotic mentality of the organic lesion would be the very one to lack the concentration for exact recollection and then to exaggerate the difficulty through anxiety.

*Alexia.*—Weisenburg stated that hemianopsia was present in all of his selected cases. To expect the unstable mentality of the cerebral lesion to find and apply the expedients necessary to read in the face of hemianopsia amounts to credulity.

*Agnosia.*—The visual type is the only one for which Weisenburg finds much evidence. According to Nielsen and others these lesions are typically bilateral and located in the convex surface of the occipital lobes. In one of my cases a mild dimming of vision was found present, of which the patient, owing to the mental instability, was unaware. The conclusion was that this was the effect of an edema penetrating to the visual fibers of the calcarine region. The elucidation is that the visual disturbance while slight is a sufficient handicap to upset the unstable mentality and produce the curious (partial) inability to recognize objects seen, which has been designated visual agnosia.

Much has been made of the difference in accuracy between deliberate and impulsive responses. But does not the delayed response merely give opportunity for emotional factors to come into play? The same is true of the hysteric patient with, say, a paralyzed arm; upon impulse the arm moves well enough.

*Frontal Lobe Syndrome.*—Numerous manifestations have been described for this condition and the elucidation given that the findings represent a loss of higher mental synthesis or moral consciousness. But do the pictures generally described imply more than well preserved intelligence with an emotional instability? I can see how that could be the case; the unstable person may be moody, impulsive, unreliable, irresponsible and perhaps in mild cases given to levity. Moreover Dandy and Penfield mention instances of excision in which few, if any, mental changes followed. Considering also probable reactions at a distance from the rather large lesion usually described there is therefore reason to believe that this syndrome is from but not of the frontal lobe.

Apraxia, that peculiar difficulty in execution, has been magnified by some into a cult that accounts for almost everything awry in the picture of aphasia. But to me it is no more than a sign of an extreme instability connected with a severe lesion, perhaps in an older person or one with a natural tendency to momentary confusion. The bizarre movements that caricature the intended act are taken to be merely signs of a mental confusion that arises in the course of the execution. Furthermore, apraxia has been described as arising from lesions almost throughout the hemisphere, which is another reason for doubting that any special function is involved. Apraxia is consequently considered the indication of a highly unstable mentality that lacks the force necessary to overcome inertia prior to the initiation of an act or the steadiness essential to carry the act efficiently through to execution.

By this line of reasoning it appears that the bet-

ter evidence supports the conclusion that the cortex is not concerned, at least primarily, with any of the higher-level functions. Heretofore the premise invariably adhered to has been the necessary participation of the cortex; but it is now seen that the old contradictions and obscurities are avoided and few or no new obstacles are encountered if the contrary assumption is followed. The most convincing single piece of evidence is the excellent mental performance possible with large lesions throughout the left (dominant) cerebral hemisphere. It simply does not appear reasonable, as already mentioned, that a mind able to grasp what is read, conduct business affairs or complete other tasks of equal complexity can be lacking in faculties of any importance; and consequently failures are to be accounted for on some other basis than defect.

Up to this point the argument has been based upon the characteristics of the syndromes themselves; but, as a matter of fact, the research was actually conducted the other way around, the original search being for that part of the brain lesions of which cause qualitative mental changes. The qualitative change adopted as the criterion was mental confusion or clouding of consciousness, as indicated mostly by disorientation, because this was a fairly definite and easily recognizable state (and incidentally this is the only qualitative change that has been identified). As a prelude the negative findings by surgeons, chiefly Dandy, and mostly verified personally later, were based on such operations as excision of the entire right hemisphere and large masses of the left frontal, occipital and temporal lobes. The remaining area in the left (dominant) hemisphere was further narrowed down by cases of vascular accidents encountered by myself. The eventual finding was that mental clouding is produced by small lesions in the neighborhood of the left optic thalamus only. (Finer localization was prevented chiefly by the ease with which death supervenes when lesions involve this area.) The chief mental activities must therefore be carried on or at least activated in this neighborhood, a suggestion that has already been made by a few writers.

This suggestion immediately makes it clear why cortical lesions give rise to instability rather than to qualitative sectional defects, for the influence on the mental functions or, better, the structures serving them, comes from the outside. It also gives us an inkling of the source of the potency of the speech zone because this is the portion of the cortex that lies directly over the thalamus. The agency through which lesions of the speech zone affect this presumed locus of mental activity is in doubt but there are a number of possibilities, for instance, circulatory imbalance, lymphatic congestion, edema, pressure, physico-chemical changes and loss of normal compactness.

Admittedly much is still wanting to complete the picture. Is mentality entirely served by so

small an area or is it only somehow activated there? Why does some responsiveness nearly always remain whatever the depth of the mental involvement and what is its source? Perhaps these problems will be solved by some rare combination of clinical and anatomical findings or by animal experimentation.

Finally it is obvious that this denial to the cerebral cortex of any functions above the motor-sensory level and the assignment of these functions to the region of the brain stem introduce a new philosophy of central nervous activity. If the cerebral hemispheres, like the cerebellum, serve only coordination and regulation and the basal regions the higher functions, then many new avenues of research are opened up.

University Club Building.

The case reports referred to may be traced in the following articles by the writer.

Defects of Intelligence from Focal Lesions Within the Central Part of the Left Cerebral Hemisphere, *Am. J. Psychiat.* 94:615-633 (November) 1937.

A Simple Version of Aphasia, *J. Nerv. & Ment. Dis.* (to appear).

## BACKACHE DURING PREGNANCY AND ITS MANAGEMENT

EDMUND LISSACK, M.D.

CONCORDIA, MO.

Backache during pregnancy not only is distressing but is a symptom of some underlying condition. The term includes a variety of pains, aches and sensory disturbances, the cause of which may be suspected after a careful history but can be determined only after a complete examination of the entire body including roentgen ray studies, especially of the lower spine.

The most common location of backache during pregnancy is the lower spine. A careful consideration of the anatomy and the mechanics of the spine readily shows why this should be so. Except for the lower cervical spine the lumbar spine has more visceral attachments either directly or indirectly than has any other portion of the vertebral column. Many organs have their nerve supply largely from this segment. The freely movable lumbar spine is attached to the relatively fixed pelvis with the spine balanced on an inclined plane at the lumbo-sacral joint. Both the body above the pelvis and the legs below are attached to the lower back by a powerful group of muscles. These anatomical arrangements make the low back peculiarly susceptible to pain.

Usually the cause of the backache originates in the back itself. Often, however, it may be due to diseases in other organs of the body. Primarily the cause may be infectious or metabolic; it may result from trauma of the bones or soft tissues; it may follow muscular or ligamentous strain or it may be due to anomalies of the spine itself. More specifically, backache may be due to relaxation of



the pelvic joints; sacro-iliac strain; faulty posture; lumbosacral strain; anatomical anomalies of the spine which produce undue susceptibility to mechanical strain; fatigue; diseases of the bowel such as appendicitis; a large number of infectious diseases, especially smallpox and typhoid; diseases of the spine such as tuberculosis; and diseases of the urinary tract including those of the ureter.

#### RELAXATION OF THE PELVIC JOINTS

Knowledge of the behavior of the pelvic joints in pregnancy is interesting, not only in relation to the clinical management but also because of the light it may shed upon a type of physiological process affecting certain articulations about which so little is known. The relaxation of the pelvic joints in pregnancy may also have some remote significance in that not infrequently chronic backache is found to have originated following a labor.

There has been much controversy and differences of opinion about pelvic joint relaxation. Some believe that it is a normal and constant phenomena, others believe that it is exceptional and pathological. Most physicians, however, accept the view that the pelvic joints soften and become relaxed during pregnancy.

Radiologists have made series of studies of the pelvis during pregnancy and from these studies concluded that little measurable change could be demonstrated in the sacro-iliac joints, but noted marked changes at the symphysis pubis.

Anatomists describe the symphysis as an amphiarthrosis and each pelvic bone covered by a layer of hyaline cartilage. Four ligaments comprise the symphysis, each varying considerably in thickness and strength.

There is little motion in the sacro-iliac joints, they being primarily intended as shock absorbers. The sacrum is wider in the anterior surface and lies between the iliac bones like an inverted keystone in an arch. The iliosacral ligaments maintain it in place. Forward displacement is prevented by these ligaments, but forward displacement does occur when these ligaments are relaxed. These ligaments likewise are softened normally in pregnancy.

With definite evidence of relaxation and the time at which it occurs, the question of the causative factor arises. The process beginning early in pregnancy and being well established by the sixth month before pressure and force of the uterus can have developed to any extent and the gradual retrogression within a few months after birth point to a biologic nature of the process and possibly hormonal.

The symptoms resulting from the softening and relaxation of the ligaments may be referred to the pubic joints or to the sacro-iliac joints or to a combination of both joints. Symptoms resembling arthritis are produced as follows: pain referred to the joints involved, usually worse when beginning

to move after sitting or lying; tiring easily, with a general sense of weakness; a sensation of snapping on movement of the bones when walking or even an inability to walk normally. The gait is a peculiar waddling. A distinct rising and falling of the crests of the ilia can be seen which is not all due to the tilting of the pelvis. The distress in walking may at times be a real pain referred to the affected joints. It is worse in multiparae.

A proper support such as a narrow belt with straps and buckles in the center front will benefit this condition greatly. This will gird the bony pelvis in a firm and rigid manner.

#### SACRO-ILIAC STRAIN

The sacro-iliac articulation is of great significance during pregnancy. It possesses little motion. The cartilaginous surfaces are held together by the anterior sacro-iliac ligament which makes up part of the posterior and lateral aspect of the birth canal. This attachment is further strengthened anteriorly by the ilio-lumbar ligament and posteriorly by the strong interosseous and posterior sacro-iliac ligaments. These joints are among the strongest in the body and during pregnancy they must yield slightly to pressure but not sufficiently to permit injury with loss or impairment of function.

The symptoms of an acute strain come on suddenly. There is a knife-like pain as if something had been broken while the patient was lifting or stooping. The pain localizes immediately over one or both of the sacro-iliac ligaments. Pain is also referred down the course of the sciatic nerve. Muscle spasm is present and motion of the lower spine is limited. The joints are quite tender to touch.

The use of a properly fitted support together with rest in the recumbent position seems to be the best therapeutic measure available. Adhesive strapping may be used as a less efficient and less comfortable substitute.

#### FAULTY POSTURE

Faulty posture alone may be responsible for many troublesome backaches during pregnancy. Before ascribing backache to a defective posture, however, it is well to exclude the possibility of disease processes involving the bones, joints, muscles and ligaments that actually may have damaged these structures. A roentgen ray examination is always necessary.

Acquired flat feet with strained and relaxed ligaments, inward curvature of the knees, an exceedingly large and pendulous abdomen, a slouch resulting from poor muscle development or any condition which alters the normal curve of the spine so that the body weight is constantly transmitted in a faulty manner are causes of faulty posture. These conditions are apt to produce a strain on the lumbosacral joints and contribute to an ache in this region of the back.

Considering the anatomical aspect we find that the lumbar vertebrae are held in position mainly by the anterior and posterior common ligaments and the supraspinous and interspinous ligaments. These are kept either taut or relaxed according to the attitude of the spine. When this strain is constantly repeated or prolonged, aching results. These ligaments are reinforced by the sacrospinalis muscle which extends from the sacrum to the cervical region. This muscle is a large mass, larger in the lumbar region than elsewhere, and it is by its aid that spinal movements take place and the trunk is held erect. The brunt of this action falls on the lumbosacral region. When this muscle is strained, therefore, or when it is not strong enough to carry out its normal or increased function, aching results in the lumbosacral region.

The upper surface of the sacrum is usually inclined forward at an angle of about 45 degrees but varies considerably in different women owing to differences in pelvic inclination. The bony anchorage of the sacrum and fifth lumbar vertebra is solid with numerous and firm ligamentous supports. These are so developed that it is quite impossible for the spinal column to slip forward upon the sacrum, yet strain does develop at this point because the joint lies between the solidly fixed and the mobile section of the spine exactly in a place where it is subjected to tremendous leverage from the upper back and the legs. Normally the curve and structure of the back are so arranged that the trunk is supported and movements are performed with a minimum expenditure of energy. Any variation from this arrangement renders the mechanism of the back less efficient and a much greater tax is imposed on the muscles and ligaments of the spine. This condition occurs during pregnancy when, with the enlarging uterus and a gradually changing center of gravity, the muscular and ligamentous structures of the back have to withstand increasing strain in order to maintain the erect position. When there is a weakened condition and loss of tone of the back muscles, as is often found after frequent pregnancies, the strain that the lumbosacral spine is normally accustomed to becomes too great for the weakened structures and backache is the result.

Backache due to lumbosacral strain is usually not sharply localized. Often the pain is referred down the legs. Tenderness centers about the lumbosacral joints but is not definitely localized and may be diffused and involve one or both sides. There is marked muscle spasm of the erector muscles and movement is restricted.

The lumbar arch and the plantar arch are in many respects analogous. The aching condition found with flat feet is caused by a strain on the ligamentous structures of the flattened and weakened arch. This condition can usually be relieved by mechanically supporting the sagging or broken arch.

Suitable exercise and massage usually will improve the circulation, strengthen the muscles that normally support the arch, stimulate repair and gradually the support can be dispensed with and the arch maintained by the muscles and ligaments that have been rested and restored to function. Adequate rest and support are the most essential factors in the treatment of backache due to faulty posture during pregnancy. This problem is not as simple as it appears. The support must be adequate and adjusted to the exact degree desired by the patient to afford relief and comfort; it must relax the strained ligaments and muscles and put the arch at rest. The support must not be too strong nor too weak else it will fail in its purpose. The support should extend over and above the lumbar region. It should be held against the spine at the top by means of a wide shaped piece of material which comes around the body and fastens on the sides with lace adjustments. The back should be closed. The front and back should be of firm fabric with elastic side panels. The material should be light in weight but firm.

#### FATIGUE

Fatigue is a frequent cause of pain in the lumbar region of the back during pregnancy. This complaint may be made by a woman with a perfectly normal physique who has been weakened by a recent illness or who has been fatigued by an unusual muscular exertion. This exertion need not necessarily have amounted to an actual strain. A few days of complete bed rest with good sleep will relieve this form of backache.

#### BACKACHE DUE TO OTHER CONDITIONS

Backache produced by such conditions as appendicitis, urinary tract disturbances, the infectious diseases and tuberculosis of the bones of the back require their respective therapeutic measures for relief.

Many women believe backache to be a necessary part of pregnancy. It may be considered only a minor disturbance in some cases but, nevertheless, it behooves the physician to give this complaint serious consideration. It is always wise to examine the backs of all women who complain of backache. Etiologically, it is often most difficult to deal with.

#### CONCLUSIONS

1. Relaxation of the pelvic joints and particularly of the symphysis pubis is a normal accompaniment of pregnancy.
2. Symphyseal relaxation is accompanied by an increase of pubic mobility and is frequently associated with backache resulting from instability of the pelvic joints.
3. The sacro-iliac joints, while normally fixed in the nonpregnant state, are certainly movable during pregnancy.



4. This normal relaxation during pregnancy makes these joints liable to injury; they are often the cause of discomfort, pain, displacement and even disability.

5. Faulty posture alone may be responsible for many troublesome backaches during pregnancy.

6. Fatigue is a frequent cause of pain in the lumbar region of the back during pregnancy.

7. Backache during pregnancy is often due to such conditions as diseases of the bowel, the urinary tract, the spine and the infectious diseases.

8. Every pregnant woman complaining of backache should have her back examined.

9. A properly fitted maternity support is recommended in all cases.

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#### BIBLIOGRAPHY

- Abramson; Roberts, and Wilson, Relaxation of the Pelvic Joints in Pregnancy, Surg. Gynec. & Obst. 58:595, 1934.  
Adam: Backache From an Obstetric and Gynecologic Standpoint, Am. J. Obst. & Gynec. 14:742, 1927.  
Chamberlain: Symphysis Pubis in the Roentgenological Examination of the Sacro-iliac Joint, Am. J. Roentgenol. 24:621, 1930.  
Curtis: Obstetrics and Gynecology, 1934.  
DeLee: Principles and Practice of Obstetrics, 4th Ed., 1924.  
Edgar: Practice of Obstetrics, 5th Ed., 1916.  
Gaker: Pelvic Relaxation in Pregnancy, J. Med. 17:176 (June) 1936.  
Goldthwaite: Shattuck Lecture, Boston Med. & Surg. J. 82:881, 1915.  
Kuhns: Low Back Pain, Rhode Island M. J. 19:131 (September) 1936.  
Litzenberg: Sacro-iliac Joints in Obstetrics and Gynecology, J. A. M. A. 69:1759, 1917.  
Lynch: The Pelvic Articulation During Pregnancy, Labor and the Puerperium, Surg. Gynec. & Obst. 30:575, 1920.  
Polak: Manual of Obstetrics, 2nd Ed., 1922.  
Schumann: Textbook of Obstetrics, 1937.  
Shelling: Relaxation of the Pelvic Symphysis During Pregnancy and Parturition, Am. J. Obst. 2:561, 1870.  
Williams: Obstetrics, 4th Ed., 1917.

#### RESTORING ARTERIAL CIRCULATION PREVENTS AMPUTATION OF ARM

A method which artificially restored the blood circulation in the major artery of the arm after a severe injury, prevented amputation of the extremity and improved its functioning, H. D. Cogswell, M.D., and C. A. Thomas, M.D., Tucson, Arizona, report in *The Journal of the American Medical Association* for May 11.

After a crushing injury to the arm due to an automobile accident a blood clot had formed in the artery, and it was feared that gangrene (death of an area of tissue due to deficient circulation) would develop and the arm would be lost. This was avoided by placing a rubber cuff on the arm and inflating the cuff to a pressure sufficient to constrict the veins in much the same way as do alternate heart beats. This pressure was maintained for two minutes and then released for two minutes, approximating the cycle of the heart beat. The cycle was continuously repeated for nearly two days.

The constriction of the veins produced an expansion of the artery. Thus the blood was forced to circulate in the artery and the clot was dissolved.

The hand and forearm gradually improved, assuming a normal color and temperature, and their function was restored.

## HAY FEVER

THE VALUE OF DAILY ATMOSPHERIC COUNTS OF  
POLLEN GRAINS AND MOLD SPORES IN  
DIAGNOSIS AND TREATMENT

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ST. LOUIS

In the management of the hay fever patient an adequate knowledge of the number and kinds of pollen grains in the air is important. It is also necessary to determine by field observations the abundance and distribution of growth of the various plants concerned. Atmospheric and field observations made in different parts of the United States have shown that each locality or community presents an individual problem as related to the number, variety and seasonal occurrence of the various hay fever pollens. A number of observations made during the last few years have shown that certain molds also are present in the air during the hay fever seasons and it has been found that a significant percentage of hay fever patients may be sensitive also to these molds. Observations on the daily atmospheric counts of the pollen grains and mold spores made during the ragweed hay fever season of 1939 are presented to point out their value in the management of the hay fever patient.

Since the symptoms of the hay fever patient are dependent primarily upon the concentration of pollen, and sometimes the mold spores in the air, it is necessary to take into consideration the various factors which influence the growth and distribution of these causative agents.

#### FACTORS WHICH INFLUENCE THE DISSEMINATION OF POLLEN

Among the various factors which influence pollen growth and distribution, and consequently the patient's symptoms, weather conditions and wind movement are perhaps the most important. The crop of ragweed pollen, for example, is dependent to a great extent upon preseasonal rains. The severity of the ragweed season may be predicted, therefore, on the basis of the amount of rainfall during June, July and August. With plenty of rain, the weeds obtain a maximum growth and consequently produce a large crop of pollen. If, however, the rainfall is meager, the growth of weeds will be stunted and the amount of pollen produced will be correspondingly small. Rains occurring during the pollinating season produce only a temporary effect on pollen distribution because pollen is present in the upper air and soon contaminates the relatively clean area. Rains occurring in the early morning hours interfere with the dissemination of pollen as most of the day's yield of pollen is thrown into the air in the early morning. The greatest amount of pollen is disseminated on dry windy days.

Ragweed pollen is most abundant in agricultural districts. The heavy crop of weeds which grows

along the highways and railroads is especially important in causing symptoms in the patient who travels. In the cities, the vacant lots on which the weeds are permitted to grow are the chief source of pollen. In general, the greatest amount of ragweed pollen is found in the agricultural districts of the Mississippi Valley in which the pollen crop is five times greater than in the large eastern cities.

Variations in humidity and temperature play an important part in affecting the patient's symptoms because of the influence on pollen production. The days with high humidity, precipitation and low temperature show the least amount of pollen in the air and, consequently, the patient has less symptoms on such days. On days with low humidity, no rainfall and relatively high temperature, there is an increase in the dissemination of pollen and an increase in the patient's symptoms. Under ordinary conditions, the amount of pollen in the air varies directly with the wind velocity. The amount of sunshine is another important factor because it enhances the ripening and discharge of pollen. Sunshine in the early morning hours is especially effective. High humidity interferes with the ripening of pollen. Frost does not influence pollination because it is usually completed by the time for frost. Cool weather will stop the ragweeds from pollinating but warm weather late in the season will cause a revival of pollination.

#### ATMOSPHERIC MOLDS

Observations made on atmospheric molds throughout the most important ragweed area (Mississippi Valley) show the mold *Alternaria* the most important. Such molds as *Hormodendrum* (*Cladosporium*), rusts and smuts are considered of secondary importance. The observations on these molds made by Durham<sup>1,2</sup> conform closely with those made in St. Louis. The factors which influence the growth and distribution of pollen do not necessarily have the same effect on the molds. The differences which may occur are worthy of consideration.

According to observations of Hopkins, Benham and Kesten<sup>3</sup> and of Durham<sup>1,2</sup> there is in the average *Alternaria* conidium about one third the volume of vegetable substance as in the average ragweed pollen granule. *Alternaria* spores are considerably more buoyant than ragweed pollen granules. Sufficient data are not available as yet from which to draw any conclusions as to the effect of various weather factors on the production and distribution of mold spores. The life cycle of *Alternaria* may be completed within a period of two or three days. The effect of wet and dry weather on the growth of the mold, therefore, would be marked and would differ widely from the effect of sunshine, rainfall and temperature on the growth of a ragweed crop in which the life cycle covers a period of five or six months. Durham states that the immediate effect of rain might be the same on spore

distribution as on pollen distribution, but on rainy days there is often a heavy fall of pollen and almost no spores. During long periods of hot dry weather the ragweed pollinates well while with the *Alternaria* the production of spores discontinues within a week after a rain, especially if the temperature is high. Spore formation begins again after more moisture is available. Convection currents and strong lateral winds disseminate both pollen and spores.

Durham found no correlation between the effect of weather and climate on the production and distribution of spores and of ragweed pollen. A good pollen year may be, for example, a poor year for spores and vice versa. A more abundant vegetation does not necessarily support a correspondingly abundant growth of molds. Durham also noted that, in general, *Alternaria* needs less moisture for optimum production than does the ragweed.

The *Alternaria* season usually does not begin until May and in most places not until July. There are exceptions, however, in the warm climates. Both the ragweed belt and the *Alternaria* belt center in the agricultural states, but the center of the ragweed belt lies east of the center of the spore belt. The Rocky Mountain area has not shown any great fall of mold spores. Durham found that the west, east and gulf coasts, do not have *Alternaria* spores in any large amount, at least during the summer season.

More recent studies of the incidence of air borne fungus spores by Durham<sup>2</sup> were based upon the examination of 10,000 exposed slides. Counts were made of the spores of *Alternaria* and *Hormodendrum* (*Cladosporium*). Rust spores also were noted and, when particularly abundant, were counted. *Alternaria* spores are lighter than ragweed pollen grains so that a slide count represents a numerically greater suspension of spores than ragweed pollen grains. For purposes of comparison the figures for *Hormodendrum* spores were even more unsatisfactory than *Alternaria* because *Hormodendrum* spores vary greatly in size and float in masses rather than as single particles. Clumps of these spores may contain only five or six but may contain from forty to eighty spores. Durham noted *Alternaria* and *Hormodendrum* spores in the air in greatly varying numbers in all parts of the United States and in southern and eastern Canada. Rusts and smuts also are found. Durham states that the straw of wheat and other grains offers an ideal culture medium for the growth of these molds. *Alternaria* and *Hormodendrum* spores were found to be most numerous in the North Central States. The highest spore counts do not always compare with the pollen counts. They usually occur when strong winds blow from the northwest.

Durham's study for 1937 showed that the rust spore season began as early as May in Texas and Oklahoma and later in the Central and Northern States. Large numbers of smut spores were en-



countered in a few places. In the winter wheat belt the smut appeared about June 20 or 24 while in Minnesota it occurred on July 6 (10,000 smut spore count).

In addition to the extensive studies by Durham on the atmospheric molds, special investigations have been conducted in certain localities by such observers as Prince, Selle, and Morrow<sup>1</sup> in the coastal areas of Texas; Pratt<sup>5</sup> in Boston; Schonwald<sup>6</sup> in the Pacific Northwest; Wittich and Stackman<sup>7</sup> in Minneapolis; Feinberg<sup>8, 9, 10, 11, 12</sup> in Chicago; Brown,<sup>13</sup> Bernton and Thom<sup>14</sup> in Washington, D. C. Pollen and mold spore counts have been made at various altitudes by McQuiddy<sup>15</sup> of Omaha, Nebraska; Durham of Chicago, and by Proctor,<sup>16</sup> and Meier and Lindberg.<sup>17</sup>

#### POLLEN SURVEYS

Atmospheric pollen studies are undertaken primarily to determine the probable contact the patient may have with pollen by detecting and counting the pollen in the air which the patient breathes. Samples of pollen may be obtained by exposing microscopic slides coated with a thin layer of glycerine-jelly containing basic fuchsin stain for periods of twenty-four hours. The pollen grains are counted under low magnification of about 150 to 200 diameters. The unit area examined is 1.8 square centimeters. The amount of pollen counted on slides exposed for twenty-four hours represents the number of pollen grains per cubic yard of air. It has been customary to count the atmospheric molds along with the pollen.

In St. Louis and vicinity three distinct hay fever seasons occur. The first is the tree season which begins about March 1 and continues until early in June (Fig. 1). The principal trees causing hay

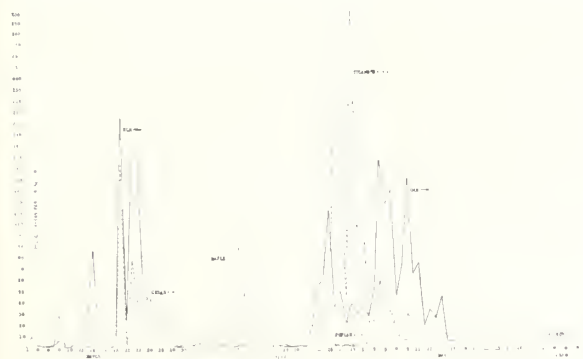


Fig. 1 Daily atmospheric counts of tree pollen grains for the season of 1939.

fever in order of their pollination are: elm (*Ulmus americana*), cedar (*Juniperus virginiana*), maple (*Acer saccharum*), willow (*Salix fragilis*), poplar (*Populus deltoides*), sycamore (*Platanus*), oak (*Quercus alba*), pecan (*Carya pecan*), hickory (*Carya*) and walnut (*Juglans*). Each type of tree has a pollinating period of about three weeks. The second, the grass season, begins in early May and

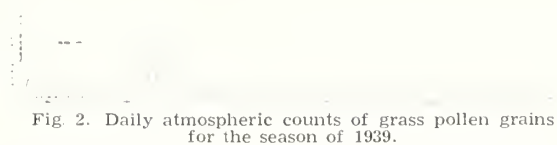


Fig. 2. Daily atmospheric counts of grass pollen grains for the season of 1939.

lasts until about October (Fig. 2). The early grasses are June (*Poa pratensis*), orchard (*Dactylis glomerata*), Johnson (*Sorghum halepense*), Sweet vernal (*Anthoxanthum odoratum*) and Bermuda (*Cynodon dactylon*). English plantain (*Plantago lanceolata*) begins to pollinate with the grasses and continues well into the ragweed season. About June 15 timothy (*Phleum pratense*), red top (*Agrostis palustris*) and rye grass (*Lolium perenne*) begin to pollinate and continue until about August 1. During the ragweed season a small amount of grass pollen continues from Bermuda grass, Johnson grass, tall red top and spreading witch grass. The third, the ragweed season, begins on or before August 15 and continues until about October 10 (Fig. 3). During the 1939 season, however, it extended until October 30.

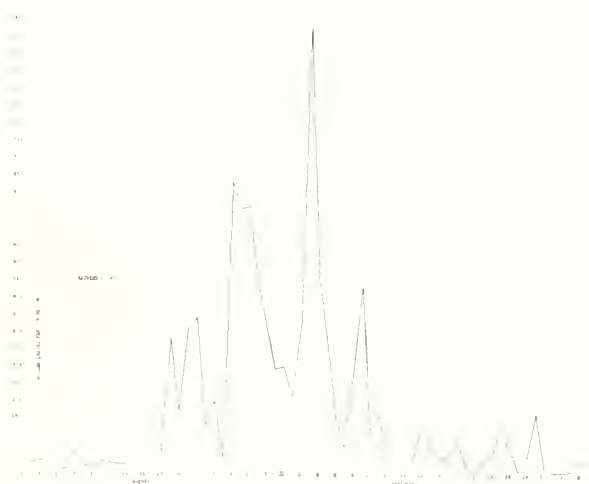


Fig. 3. Daily atmospheric counts of ragweed pollen grains for the season of 1939.

Atmospheric studies should be started about the last week in February and continued until late in the fall. Mold spores may continue in the air in considerable numbers after the ragweed season if weather conditions are favorable.

#### RAGWEEDS, MISCELLANEOUS WEEDS AND GRASSES

In St. Louis and vicinity the fall type of hay fever is caused chiefly by the members of the ragweed family, the most important of which are: short ragweed (*Ambrosia elatior*), giant ragweed (*Ambrosia trifida*), Southern ragweed (*Ambrosia bidentata*), true marsh elder (*Iva ciliata*), burweed marsh elder (*Iva xanthifolia*), cocklebur (*Xanthium commune*), sunflower (*Helianthus annuus*), goldenrod (*Solidago speciosa*). Short and giant ragweed and the marsh elders are the most important and produce the greatest amount of atmos-

pheric pollen, constituting about 80 per cent of all the pollen in the air during the ragweed season. Sunflower and goldenrod are almost entirely insect pollinated, consequently are not an important factor unless the patient has close contact with the plants.

The pollen grains of a few miscellaneous weeds and grasses constitute the remaining 20 per cent of the total. They play only a secondary part in certain cases of ragweed hay fever. These miscellaneous weeds are: lamb's-quarters (*Chenopodium album*), English plantain (*Plantago lanceolata*), Russian thistle (*Salsola pestifer*), pigweed (*Amaranthus retroflexus*), western water hemp (*Acnida tamariscina*).

A few grasses such as the following are considered secondary factors: Bermuda grass (*Cynodon dactylon*), Johnson grass (*Sorghum halepense*), June grass (*Poa pratensis*), rye grass (*Lolium perenne*), tall, false redtop (*Tridens flavus*), spreading witch grass (*Panicum dichotomiflorum*). Of the miscellaneous group of weeds, lamb's-quarters pollen constituted 73 per cent while the remainder of the group were present in 27 per cent.

For the entire hay fever season, there were 20,097 pollen grains of which 5,604 (27.88 per cent) were trees, 1,288 (6.41 per cent) were grasses and 13,205 (65.71 per cent) were weeds. Among the weeds 80 per cent were of the ragweed family.

#### THE RAGWEED HAY FEVER SEASON OF 1939

In St. Louis and vicinity the ragweed hay fever season officially begins on August 15 and the days showing the highest pollen counts are the last three to five days in August and the first five days of September. With favorable weather conditions, however, ragweed pollen may appear in the air in significant amounts as early as August 1 with symptoms appearing in most patients from August 5 to August 10. Ragweed pollen appeared in the air in 1939 on July 16 but did not show a significant increase until about August 1 (Fig. 3). A small peak of about 100 grains per unit area occurred on August 16. After a slight fall on August 17, there was a sudden rise of concentration on August 18. On August 21 there was another sudden increase in the count to about 440 grains per unit area. On the weekend of August 25, a high concentration was reached, the count being between 750 and 800 grains. After a rain and wet weather there was a sharp fall and then an increase to the peak day on September 3 (1,375 grains). Following a sudden decrease there was another high count on September 9. From September 10 until October 5 there was a gradual decrease in the concentration as shown in the graph. Because of dry weather ragweed pollen remained in the air in small amounts until November 11. After September 9, 1939, with the sudden decrease in the atmospheric concentration of ragweed pollen, there was a striking improvement in all patients. After passing through the peak days of high

concentration an increased tolerance for pollen is acquired. The lower concentrations which follow therefore do not cause significant symptoms in most patients. At the beginning of the season when the concentrations are about the same there is a gradual increase in the patient's symptoms with the increasing pollen count. These phenomena are especially striking in patients who have not had treatment or who have not responded satisfactorily to the injections of ragweed extract.

#### ATMOSPHERIC MOLD COUNTS FOR 1939

During the entire season there were 10,412 mold spores as follow: *Alternaria* 3,589 (34.47 per cent), *Hormodendrum* 2,533 (24.33 per cent), *Helminthosporium* 278 (2.67 per cent), and rusts and smuts 4,012 (38.54 per cent).

#### THE DIAGNOSIS AND TREATMENT OF HAY FEVER

The diagnosis of hay fever is based upon an analysis of the clinical symptoms, the nasal findings, the demonstration of eosinophiles in the nasal secretion and the results obtained from skin tests with pollen extracts. The symptoms of hay fever are usually typical, characterized by attacks of sneezing, itching of the eyes, nose and throat, profuse nasal discharge and nasal obstruction. Sometimes the nasal symptoms are accompanied by cough and asthma. The symptoms occur at the time of the year when it is known that certain pollens are in the air. Atmospheric studies are of indispensable value in determining the kinds and amounts of pollens in the air. In mold sensitive patients an exacerbation of symptoms may occur when the mold count is high and the pollen count is low. In general symptoms from pollen vary according to the atmospheric concentration of pollen. Some of the tree and grass sensitive patients may have symptoms only when the pollen concentration is high. Sometimes the patient has the impression that he is suffering with a spring or summer cold.

Examination of the nose of the hay fever patient usually shows a pale boggy edematous mucosa with profuse watery mucoid secretion. The microscopic examination of the nasal secretions, stained with Wright's or Giemsa stain, shows clumps of eosinophiles. In atypical cases hay fever can be differentiated immediately from the common cold by this cytologic examination. In order to confirm further the diagnosis of hay fever, skin tests for the pollens suspected should be performed. A definite skin reaction to one or more pollens indicates that the patient is sensitive. There are some instances in which, however, positive skin reactions are present in the absence of clinical symptoms. Such positive reactions may suggest potential sensitivity. Positive reactions are obtained frequently to biologically related pollens, some of which may not be present in the patient's environment. Actual contact with pollens can be determined only by atmospheric and field studies. It is possible that the skin reactions



may be negative. This, however, is exceptional. In all instances of false positive or negative skin reactions, the ophthalmic and nasal tests should be performed.

During the last few years a number of observations have been made which prove definitely that a considerable percentage of hay fever patients are sensitive to the atmospheric molds. These patients should receive treatment with mold as well as pollen extracts. For this vicinity the following molds are of primary importance: *Alternaria*, *Hormodendrum* (*Cladosporium*), *Helminthosporium*, rust, smut, *Aspergillus fumigatus*, *cephalothecium roseum*, *Mucor*, *Penicillium rubrum* and *Monilia sitophilina*. *Alternaria* is, however, the most important of all the atmospheric molds. In milling districts, Wittich and Stackman found that smuts and rusts play equally as important a part in respiratory allergy as do the common molds.

A number of recent reports on mold sensitivity in respiratory allergy give some idea of the incidence of importance of this factor. In a group of twenty patients Brown noted positive reactions to *Alternaria* in six, or 30 per cent. Prince and Morrow reported mold sensitivity in thirty-seven of forty-six patients who were selected from a group of 200 cases. *Aspergilli* were found to be the most important. Feinberg noted that sixty-eight or 28 per cent of 243 patients gave positive mold reactions. In another report Feinberg gave his observations on a group of fifty-four patients whose hay fever and asthma were aggravated by mold sensitivity. Forty-two of these patients were treated with mold extracts and 80 per cent obtained satisfactory results.

In 150 patients tested for mold allergy Schonwald noted the following incidence of reactions: *Penicillium* (67.5 to 77.8 per cent), *Trichoderma* (72 per cent), *Alternaria* (70 per cent), *Aspergillus* (68.6 per cent) and *Rhizopus* (41 per cent). Of eighty-six patients who had adequate treatment, sixty-six or 76.7 per cent showed definite improvement by mold extracts or additional antigens. Fifty-seven of the improved patients had multiple sensitization. In twenty-two, mold allergy was complicated by pollinosis, in nine by food allergy and in twenty-six by both pollen and food sensitization.

Harris<sup>18</sup> found mold sensitivity among twelve patients whose respiratory symptoms were much aggravated during the summer months although they did not coincide entirely with the pollen seasons. Eleven of the twelve patients reacted to *Alternaria*, five to yeast and nine to *Aspergillus*. Of ten patients treated with mold extracts, eight obtained 75 per cent or more relief.

Pratt noted that 25 per cent of 177 children suffering with hay fever and asthma reacted strongly to *Alternaria* extracts. Pratt observed that the seasonal incidence of symptoms among those patients giving strong skin reactions to molds corresponded closely to the seasonal variations of mold spores

in the outdoor air when the effect of existing pollen sensitivity was taken into account. During the year 1937 Pratt treated thirty-four patients with mold extracts. Twenty-three patients received both pollen and mold treatment. Many of the patients in this group had been treated with pollen only in previous years with poor results. The improvement when *Alternaria* extract was added was striking in many instances. In a group of eleven patients who received only mold treatment, nine obtained marked relief and only two failed to receive benefit.

Among 194 patients tested for mold sensitivity Eyermann<sup>19</sup> noted positive reactions in 21 per cent. Thirty-five per cent of hay fever patients showed positive reactions, mostly to *Alternaria*. In ninety-four patients with respiratory allergy positive reactions were noted in thirty-eight or 40 per cent. Thirty-one of these patients had hay fever.

Wagner and Rackemann<sup>20</sup> cultured various samplings of bedding and furniture and found a variety of molds. They were especially common in feathers, kapok and cotton linters. These sources of contact must be taken into consideration with hay fever patients who are sensitive to molds.

Satisfactory results in the management of hay fever are dependent to a great extent upon the solution of the problem presented by each individual case.<sup>21</sup> By individualization of treatment the problem has necessarily become more complicated but the results obtained today are much more satisfactory than those obtained a few years ago.

Effective hay fever treatment is dependent upon the consideration of a number of factors. In the first place, the patient must be treated with an extract of the pollen or pollens to which he is sensitive and which are known to be in the atmosphere. Maximum dosage should be an optimum amount for the individual patient. In treating ragweed hay fever patients by the preseasonal method it was found that by starting the dosage with the 1 to 1,000,000 or 1 to 100,000 dilution optimum dosage can be reached with only an occasional mild constitutional reaction. These reactions are usually an indication of overdosage or overstepping the patient's tolerance.

Among most patients who have had poor results from ragweed treatment, the history has indicated that they had severe constitutional reactions and consequently were given dosages higher than could be tolerated. In general the average maximum dosage for adequate protection is about 0.5 cc. of the 1 to 100 dilution. Some patients, however, are not able to tolerate more than 0.5 cc. of the 1 to 1000 dilution, or less.

Since many ragweed patients are sensitive to molds and also to house dust, much more satisfactory results have been obtained by giving injections of these extracts along with the ragweed extracts. It is important to take into consideration that some ragweed patients are sensitive to foods which must be avoided if good results are to be obtained. Pa-

tients who have nonseasonal respiratory and other types of allergy are definitely sensitive to substances other than pollen. By complete history and skin tests these extra-pollen sensitivities can be determined. Nonseasonal symptoms must be controlled in order to obtain satisfactory relief with the hay fever treatment.

#### SUMMARY

1. Daily atmospheric counts of pollen grains and mold spores throughout the hay fever seasons are of indispensable value in the diagnosis and treatment of hay fever.

2. Satisfactory results in the treatment of hay fever are dependent upon individualization of the problem and optimum maximum dosage.

3. Supplementary injections of mold and dust extracts should be given in instances when indicated. Food avoidance should also be practiced in patients found sensitive to foods.

4. Other manifestations of allergy, either seasonal or nonseasonal, must be controlled by allergic management in order to obtain satisfactory relief from pollen therapy.

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#### BIBLIOGRAPHY

1. Durham, O. C.: Incidence of Air Borne Fungus Spores. I. Alternaria. *J. Allergy* 8:480, 1937.
2. Durham, O. C.: Incidence of Air Borne Fungus Spores. II. Hormodendrum, Alternaria, and Rust Spores. *J. Allergy* 10:40, 1938.
3. Hopkins, J. G.; Benham, R. W., and Kesten, B. M.: Asthma Due to a Fungus—Alternaria. *J. A. M. A.* 94:6, 1930.
4. Prince, H. E.; Selle, W. A., and Morrow, M. B.: Molds in the Etiology of Asthma and Hay Fever. A Preliminary Report. *Texas State J. Med.* 30:340, 1934.
5. Pratt, H. W.: Mold Spore Content of the Air in Boston, with Reference to Atopic Sensitivity. *J. Pediat.* 14:234, 1939.
6. Schonwald, P.: Allergenic Molds in the Pacific Northwest. *J. Allergy* 9:175, 1938.
7. Wittich, F. W., and Stackman, E. C.: Case of Respiratory Allergy Due to Inhalation of Grain Smuts. *J. Allergy* 8:189, 1937.
8. Feinberg, S. M., and Little, H. T.: Studies on the Relation of Microorganisms to Allergy. III. A Year's Survey of Daily Mold Spore Content of the Air. *J. Allergy* 7:149, 1936.
9. Feinberg, S. M., and Little, H. T.: Studies on the Relation of Microorganisms to Allergy. II. Role of Yeasts in Allergy. *J. Allergy* 6:564, 1935.
10. Feinberg, S. M.: Seasonal Hay Fever and Asthma Due to Molds. *J. A. M. A.* 107:1861, 1936.
11. Feinberg, S. M.: Mold Allergy; Its Importance in Asthma and Hay Fever. *Wisconsin M. J.* 34:254, 1935.
12. Feinberg, S. M.: Asthma and Allergic Rhinitis from Molds. *Lancet* 57:87, 1937.
13. Brown, G. T.: Hypersensitiveness to Fungi. *J. Allergy* 7:455, 1936.
14. Bernton, D. S., and Thom, C.: The Role of Cladosporium, a Common Mold, in Allergy. *J. Allergy* 8:363, 1937.
15. MacQuiddy, E. L.: Air Studies at Higher Altitudes. *J. Allergy* 6:123, 1935.
16. Proctor, B. E.: The Microbiology of Upper Air. *J. Bact.* 30:363, 1935.
17. Meier, F. C., with field notes by Chas. A. Lindberg: Collecting Microorganisms from the Arctic Atmosphere. *Scient. Monthly* 40:5, 1935.
18. Harris, L. H.: Molds as a Cause of Allergy. *Ohio State M. J.* 34:156, 1938.
19. Eyermann, C. H.: Personal Communication.
20. Wagner, H. C., and Rackemann, F. M.: Kapok and Molds: An Important Combination. *Ann. Int. Med.* 11:595, 1937.
21. Hansel, F. K.: Allergy of the Nose and Paranasal Sinuses. C. V. Mosby Company, St. Louis, 1936.

Thirty-eight BB shots and numerous flakes from them were found in the appendix of a man who ate from ten to twenty ducks and pheasants yearly, John R. Earl, M.D., St. Paul, reports in *The Journal of the American Medical Association* for May 11.

## ALLERGY AND ITS TREATMENT

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Allergy, the most recent addition to the field of medicine, is defined as an abnormal reaction by an individual to normal stimuli. Pirquet in 1906 coined the word which literally means "altered energy." Other terminology was used by various authors in describing allergic manifestations, such as idiosyncrasy, sensitization, hypersensitiveness, atopy and hyperergy. Delving into the past, one finds merely fragmentary expressions which may be observations on obvious altered health conditions, but whether they were clearly understood is doubtful.

It was not until 1819 when Bostock, himself a hay fever sufferer, described seasonal pollinosis, suggesting that it be classified separately from the diseases then known. This is plainly a misnomer but has succeeded in persisting. One hundred twenty years ago the obvious association with hay and any indisposition, whether the temperature remained normal or was elevated, was alluded to as fever.

Popular synonyms for hay fever have been "rose cold," "ragweed fever," "pollen catarrh," "June cold," "summer catarrh" or "autumnal catarrh." These refer mainly to the season or the mucous nasal discharge. A more appropriate designation would be "seasonal pollinosis" or "pollen allergy."

In 1831, Elliotson mentioned that the flower or pollen of grass might be the probable cause. Wyman in 1862 definitely proved that the disease was due to ragweed pollen. Blackley in 1873 carried the experiments further. Although he attracted little attention at the time, because the medical world was absorbed with the subject of bacteriology, he proved the etiology of hay fever and developed methods of its prevention.

#### THEORY

One cannot discuss allergy without considering anaphylaxis. Anaphylaxis meaning without protection in contrast to prophylaxis is a term originated by Richet in 1898 to express a phenomenon he observed while experimenting with animals. In his experiments he found that by injecting dogs repeatedly with eel serum instead of immunizing them against the serum, they became more susceptible to it. After considerable investigation, Richet and his coworkers, Hericourt and Portier, reached the following conclusion: "A foreign substance which on first injection may be relatively harmless, may on reinjection, become severely toxic, even fatal, when given in the same or even smaller dosage; an interval of several days must elapse between the first and second injections." This brings out the point that anaphylaxis is an artificial condition produced in a living animal by means of injecting a foreign substance.

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In 1906, it was shown by several workers that if a sensitized animal is reinjected with an amount of antigen just short of fatal, a sublethal dose, it will react but will recover. Thereafter, additional injections will produce no symptoms for a variable period of time. This observation is referred to as antianaphylaxis or desensitization. Cooke prefers the term hyposensitization.

What actually occurs and which tissues participate in causing the anaphylactic shock? Because different experimental animals show evidences of damage to different organs and tissues, it has not been until recently that any valuable conclusions have been reached although there is no unanimity of opinion. It is presumed that by injecting the antigen into the sensitized animal it will combine with sessile antibodies present in the cells damaging these cells and producing anaphylactic shock if there are no free antibodies circulating in the blood. In the latter case, immunity is established without any reaction. Is the reaction intracellular or extracellular? Some investigators are of the opinion that the reaction consists of liberation of a specific poison; others think it is purely a chemical interaction, and others assume that colloid changes take place on the cellular surface.

Regardless of which part of the cell is definitely affected, it is pretty well agreed that four groups of tissues are involved: the cells of the reticulo-endothelial system, particularly those of the liver; the capillaries with their greatly increased permeability and smooth or nonstriated muscle cells.

There are many points of similarity between allergy and anaphylaxis, yet there are arguments to show that they are not identical. A few weeks ago Dr. Cannon delivered a lecture in St. Louis and in his experiments he demonstrated the presence of precipitins in cases of allergy. Heretofore, the inability to show precipitins in allergy and their relative frequency in anaphylaxis was considered a differentiating point between the two.

Granting that the antigen is introduced into the sensitized living body tissues and there reacts with the antibody resulting in anaphylaxis or allergic response, what is the mechanism of the reaction? The most plausible theory is based on the Dale and Lewis experiments and refers to the H-substance. Dale and other investigators reproduced anaphylactic phenomena by removing smooth muscle from a sensitized animal, washing out the blood, placing it in Ringer's solution, then exposing it to the specific antigen, a reaction developed the same as in the living animal. This observation discredited the necessity of a circulating medium like blood or a fermentation process which would require incubation.

As early as 1911, Dale after studying the poisonous nature of histamine suggested that it be considered the causative factor in anaphylactic shock. Histamine will produce a reaction almost identical with that of sensitization when introduced into the animal.

In 1924, Lewis studied the wheal formation of the skin in urticaria and dermatographia and could reproduce these symptoms by injecting histamine which produces vasodilatation and wheal formation. It was shown also that histamine is present in the protoplasm of the cell in the tissues and organs of the body in an innocuous state but, under special stimuli, it may be released in large quantity and become intensely active. When entering the circulation, it may be rendered inactive by adrenalin or by a histamine-inactivating enzyme called histaminase. If not rendered inert, this histamine or H-substance, depending on its concentration and the severity of antigenic stimulation, will produce various degrees of allergic reactions or symptoms of anaphylactic shock.

Facts observed regarding allergy are that normal individuals cannot be made allergic experimentally. To produce an allergic reaction an allergen (or antigen) combines with the reagin (or antibody) in a sensitized individual. The allergic reaction localizes itself in the shock tissue or organ. This might be manifested in the skin as eczema or urticaria, in the bronchi as asthma, in the circulatory system with vasodilatation and increased capillary permeability in the gastro-intestinal tract producing gastric upsets or diarrhea; in the mucous membrane of the nose by rhinorrhea or obstruction in the conjunctiva of the eye by lacrimation and itching; in the central nervous system by migraine.

#### OCCURRENCE

Vaughan, basing his conclusions on prevalence upon his personal estimates and those of others, states that 10 per cent of the population are sufferers of major allergy while an additional 50 per cent have had, are having or will have during their lifetime, some insignificant allergic occurrence which will correct itself without the requirement of medical attention.

According to Bray, all conditions of allergy are more common in boys than in girls from infancy to puberty. The incidence is reversed from puberty to menopause. Eczema is encountered oftener in males than in females. More females suffer from migraine. Asthma is twice as frequent in boys up to puberty when it becomes a little more common in girls than in boys. Hay fever is about equally distributed between the sexes.

There is no dispute among investigators that heredity plays an important role in the predisposition to allergy. From 50 to 75 per cent of offspring of bilateral allergic parents will develop manifestations of allergy at an early age. About 33 per cent will develop it of unilateral ancestry, while less than 20 per cent will develop allergic symptoms before the age of 10 when born of nonallergic parents. The shock organ is variable and in the offspring may be the same or different from the parents. A number of investigators consider allergy as a simple mendelian dominant; Atkinson

reached the conclusion that it is a recessive characteristic, while others maintain it to be a partial dominant.

It is a comparatively simple matter to diagnose allergy if one is aware of it when taking the history. In fact, the patient will tell you what ails him; it may be hay fever, asthma, hives or itching eyelids. The difficulty lies in unearthing the etiologic factors. For this purpose one can depend upon a thorough and detailed history, physical examination and skin testing.

Tuft groups allergens under the following headings: (1) inhalants, (a) pollens, (b) dusts, (c) epidermals, (d) danders; (2) ingestants, foods and drugs; (3) contactants, poison ivy, heavy metals, chemical agents; (4) injectants, foreign or immune sera, drugs, insect bites; (5) bacterial agents; (6) molds and fungi; (7) physical agents, heat, cold, sunlight, effort, and (8) nonspecific factors. A few of the representative subgroups will be taken up.

#### SEASONAL POLLINOSIS

Pollen allergy is the outstanding example among the inhalants. The offenders are the anemophilous plants or those depending upon the wind for pollination. Among these, the weeds, the grasses and the trees cause seasonal hay fever. Of all the thousands of wind borne pollens, there are comparatively few that produce pollen disease. The weeds, especially the ragweeds, are by far the greatest offenders and their pollination lasts during August and September.

Next in importance are the grasses, timothy and June grass in the northern states and Bermuda grass in the southern states. The season duration is May and June.

Trees are of relatively minor significance. Their distribution is limited and their pollination period endures about ten to fourteen days during March and April. Some trees producing hay fever are oak, birch, poplar, hickory, walnut, beech, maple, ash, hackberry, sycamore, mulberry and elm.

Practically all are familiar with the symptoms—sneezing, rhinorrhea or obstruction of nasal passages, lacrimation or itching of the eyes. Asthma may be present as a complication or as the only manifestation.

The treatment is accomplished in two ways: (1) palliative or symptomatic by the use of mechanical devices such as masks, nasal air filters or by travel to different climate and by (2) desensitization. This consists of introducing the specific pollen in increasing quantities. Beginning with the minimum tolerated dose, the extract is injected subcutaneously until the maximum total dose is reached, watching closely for any reactions that may occur. The total nitrogen unit of Coca, the protein nitrogen unit of Cooke and the pollen unit of Noon are used by different allergists. At the Firmin Desloge Clinic the Noon unit is employed: 1 gm. dry pollen extract equals 1,000,000 units, dissolve 50 cc. equals 1 cc. equals 20,000 units; 1:500

equals 1 cc. equals 200 U. 1:5000 equals 1 cc. equals 20 U.

Treatment may be given coseasonally, in which case 1 unit is increased daily until symptomatic improvement is obtained. For preseasonal treatment start with about 20 units and inject biweekly or weekly until the highest concentration is reached.

In the perennial method one starts at the end of the hay fever season and builds up the tolerance for the pollen until maximum dosage which is maintained until the season begins.

#### INGESTANTS AND DRUGS

Almost any food ingested may produce allergic manifestations. The commonly encountered food allergens are wheat, eggs, chocolate, milk, tomato, strawberry, potato, the legumes, meats and fish. The reaction takes place in the gastro-intestinal or bronchial mucosa. The clinical signs manifest themselves in asthma, urticaria, angioneurotic edema, migraine, gastro-intestinal disturbances, allergic rhinitis and eczema. The food ingested undergoes changes in cooking and processes of digestion and the ultimate allergen differs from the one obtained in the raw state for testing purposes. Hence the skin tests are not always informative.

In treating food allergy, the aim is to completely eliminate that food for which the individual is found sensitized. Besides the exclusion diet, one desensitizes the patient orally. For this purpose, one starts with minute dilutions of the food allergen and increases the dose gradually until maximum tolerance is obtained.

Drug allergy is distinguished from drug intolerance. If a drug produces an exaggeration of its effects and is toxic in therapeutic doses, that is intolerance. In drug allergy, a less than ordinary dose will produce a reaction such as skin eruption, urticaria, pruritus or fever. The most common drug excitants are quinine, aspirin, phenolphthalein, arsenic, antipyrine, insulin, bismuth, barbiturates, essential oils, morphine, sulfanilamide, dinitrophenol and chicle.

The effect of the allergen is produced by inhalation, contact, ingestion or injection. The frequent manifestations are skin eruptions, varying from erythematous to hemorrhagic. Pruritus may accompany the eruption or may be the only symptom. Elevation of temperature may follow chilliness. Urticaria or edema may be observed. Treatment is apparently simple. After determining the causative agent, exclude it. Use adrenalin when indicated and treat the lesion symptomatically.

#### SKIN, PHYSICAL AND SERUM ALLERGY

Contact dermatitis is a self explanatory designation. It usually is acquired and the hereditary factors are negligible. It comprises dermatitis venenata, eczema, occupational dermatitis and dermatitis medicamentosa. The list of materials etiologically responsible is countless and practically any one



can be sensitized. For testing, the patch test is used. The symptoms are itching, burning and skin eruption. Familiarity with the individual's habits, hobbies, occupation, as well as the site of the lesion, offer a valuable clue as to causative agent. A few common offending agents are cosmetics, leather gloves or shoes, furs, soaps, orris root, insecticide powders, facial creams, coloring materials, hair dyes, furniture polish, stockings, wood, nickel, rubber, bakelite, fungi and molds. Treatment consists of avoiding the specific irritant and local application of ointments or lotions. Dermatitis venenata is usually caused by *Rhus vernicifera*, used in Japanese lacquer; *Rhus toxicodendron diversiloba* or poison oak; *Rhus toxicodendron radicans* or poison ivy and *Rhus toxicodendron vernix* or poison sumac. An exacerbation of symptoms by a sensitized individual may be prevented by desensitizing with an almond oil solution of the plant extract. When already exposed, the best medications are 5 per cent aqueous solution ferric chloride to prevent spread of infection, 5 per cent  $K_2MnO_4$  alum acetate; liq plumbi subacetate and calomine lotion.

Physical allergy refers to clinical manifestations inaugurated or previously existing condition aggravated by physical agents as in urticaria, eczema, itching nasal reactions, lacrimation, severe abdominal pains and even shock. The demonstration of reagins or of passive transfer has proven unsuccessful thus far. Salter in 1860 described attacks of asthma caused by applying cold to the feet. Several other observations were made until in 1923 Duke presented his studies and correlated them with allergy. Since then, many articles dealing with physical allergy have appeared in various medical publications. This condition is comparatively infrequent. The cases observed most often are those of cold sensitiveness, urticaria factitia or dermatographism, photosensitization or urticaria solaris and heat sensitiveness or urticaria abigne. Mental or physical effort may produce a syndrome of allergic reactions, possibly due to the heat generated in the body tissues.

Treatment is not always productive of results. Gradual exposure with the view of increasing the tolerance is recommended. Injections of histamine may be effective.

Serum sickness in the human so closely resembles anaphylaxis in the animal that there was no difficulty in associating the two. It may be classified as the first allergic disease known. In 1905, Von Pirquet and Schick fully described and interpreted the disease in their monograph.

Serum allergy is divided into three types: (1) Delayed reaction. A normal person following the injection of horse serum may become allergic to it after ten days. The degree of sensitiveness depends upon the quantity of serum introduced. (2) Immediate reaction, explosive and sometimes causing fatality, may take place after reinjection (up to four months) or may happen in a person atopic to horse serum. (3) Accelerated reaction appears upon re-

injection after a much shorter interval than the incubation period. The symptoms according to Mackenzie, are "skin eruption, enlarged lymph nodes, fever, edema and polyarthritis." Death has occurred following the intravenous administration of one drop of serum.

Park estimated that one in 50,000 serum injections will end fatally and one in 20,000 will develop alarming symptoms. Consensus of opinion is that serious accidents resulting from injections of serum are much more frequent than one is led to believe from the literature. Hence, one should be on the alert when using immune antitoxic or antibacterial sera for prophylactic or therapeutic purposes.

It is advisable to follow Tuft's recommendation of using adrenalin chloride (which does not reduce the efficiency of the serum) starting first dose with 0.3 cc. and repeating every hour during treatment, and if symptoms appear increase the dose up to 1 cc.

It is obvious that for an individual to manifest clinical allergy, he must be constitutionally capable of becoming sensitized. He must have the tendency to develop reagins in the shock tissue or organ when exposed to the allergen. In other words an allergic person will produce a reaction when his specifically sensitized cells are exposed for a sufficient duration to a sufficient amount of the specific excitant. Hence the nature of the allergen and the location of the sensitized cells determine the reaction. A history unfortunately is not always adequately serviceable for complete determination of the excitant. The following tests are additional aids.

#### TESTING

The patch test is advisable in contact dermatitis. This is accomplished by applying the exciting substance directly or dissolved in water or oil suspension to the skin. The reading is made within from twenty-four to forty-eight hours and compared with the control site. The positive reaction may vary from a simple erythema to a complete destruction of the epidermis with necrosis. One should be careful to avoid natural irritants such as acids or alkalis.

The nasal contact test is done by applying the extract of the product directly with an applicator, by sniffing it or injecting it into the nasal mucous membrane. The reaction such as sneezing, obstruction and rhinorrhea may sometimes become severe.

In the conjunctival test, use one drop 1:1000 dilution of the extract and wait five minutes. If there is no reaction, concentration may be increased to 1:100, 1:10 or the dried extract. Care must be used to prevent a strong reaction or traumatic irritation. For this purpose 4 cc. of adrenalin chloride 1:1000 mixed with 10 cc. boric acid solution is used for an eyewash. The intensity of conjunctival reaction is graded by comparison with the other conjunctiva. The ophthalmic test has obvious disadvantages as well as being time consuming.

The most extensive and commonly practiced testing is accomplished by the use of the scratch and the intracutaneous methods. In the scratch test the flexor surface of the arms or the back is used, making a scratch to remove the top dead layer without drawing blood, then applying the extract in saline solution. The reading can be made within from fifteen to thirty minutes. As many as fifty or more tests can be made at one sitting.

In the intracutaneous or endermal method, one uses a tuberculin syringe and 26 gage needle and injects into, not under, the epidermis. Because of the possibility of constitutional reactions, one makes only about twelve to sixteen tests. Either Coca's alkaline extracting fluid or glycerol saline, one twentieth the dilution of that used for scratch tests, is used. A uniform amount of from .01 cc. to .02 cc. is used so that the raised wheals are of equal size. A good reading is observed within from ten to thirty minutes. The observed response is classified by the formation of a wheal and its size, pseudopods and the erythema surrounding it.

The indirect transfer test, based on the Prausnitz-Küstner technic, is indicated in cases of dermatographism, ichthyotic skins, presence of skin eruptions and urticaria and in absentees by obtaining samples of their sera.

In evaluating data, one must not overlook a thorough physical examination, roentgen ray of chest and sinuses and determination of leukopenic index in certain food allergies. Eosinophilia in the blood, in the nasal smear or in the sputum are all corroborative of allergy. Curshmann's spirals in the sputum of the asthmatic patient are helpful.

Let us not omit the endocrine and the psychogenetic influences on the allergic condition. The fact that many allergic conditions are relieved by the injection of epinephrin would point to a functional disturbance in the adrenal glands. The glands associated with reproduction as the pituitary, thyroid and the ovaries present clinical evidence of more than passing importance. As mentioned previously, asthma may terminate in boys at puberty while in girls it is more likely to become more pronounced and cease at the menopause. Pregnancy may alleviate symptoms while menstruation may aggravate them. However, the association of endocrines to allergy are merely observations and cannot as yet be duplicated experimentally.

The condition of vagotonia as opposed to sympatheticotonia, as a condition present in allergic individuals, was first discussed by Eppinger and Hess in 1909. The followers of this idea maintain that the allergic phenomenon is merely a disturbed condition of the vasomotor system which is inherited and is primarily a neurosis. In vagotonia, the parasympathetics are stimulated causing bronchial constriction and other symptoms present in asthmatic patients such as "eosinophilia, dermatographism, increased sweating, slowing of pulse, reduced blood pressure, gastro-intestinal disturbances." This can

be counteracted by stimulating the sympathetic system with adrenalin producing sympatheticotonia. Vasomotor instability is of definite importance in allergic manifestations but is not the primary cause. The arguments against it are: (1) asthmatic attacks occur during sleep, (2) seasonal hay fever, (3) specific foods produce food allergy and urticaria, (4) specific desensitization, (5) Prausnitz-Küstner phenomenon.

In evaluating the clinical manifestations of allergy it is important to keep in mind the possibility of other disease conditions that may be present at the same time. Rackeman distinguishes between the intrinsic and extrinsic factors in respiratory affections, the extrinsic basically being due to an exogenous allergen which when found and excluded is productive of sometimes dramatic and prompt relief. The intrinsic is complicated by possibly bacterial pathogens or organic deficiency which make curative results almost impossible.

#### TREATMENT

Treatment of allergic conditions consists of (1) elimination or avoidance of etiologic factors such as foods, inhalants and contactants; (2) desensitization or hyposensitization may be accomplished by specific or nonspecific means; (3) symptomatic or resort to drug therapy. Numerous drugs have been used at various times for the alleviation of symptoms in allergic conditions, particularly asthma, but there are relatively few of any importance. The great stand-by, the drug of universal esteem and life saving qualities, adrenalin, derived from the medulla of adrenal glands, generally is used subcutaneously and produces prompt results by stimulating the sympathetic nerve fibers, thus overcoming bronchospasm.

Slow adrenalin which is a suspension of adrenalin in peanut oil is supposed to prolong its action, while concentrations of 1:100 are used for local spray.

Ephedrine derived from the Chinese herb Ma-Huang also acts by stimulating the peripheral sympathetic system. The hydrochloride or sulfate salts are administered by mouth or by topical application. The gastric or intestinal juices do not destroy its effectiveness. The therapeutic dose is from  $\frac{3}{8}$  to  $\frac{3}{4}$  gr.

There are untoward toxic effects which may be overcome by employing atropine or barbiturates. Synthetic ephedrine like compounds are ephedrine, neosynephrine, benzedrine and propadrin.

Next in importance is the atropine group of drugs which include atropine, belladonna, stramonium and hyoscyamus. Their action depends upon paralyzing the vagus nerve endings. Atropine is used hypodermically, 1/500 to 1/100 grain, in allergic coryza or hay fever. Belladonna is employed as an extract,  $\frac{1}{4}$  to  $\frac{1}{2}$  gr. or tincture 5 to 15 M. The leaves of stramonium in combination with potassium nitrate (saltpeter) is an ingredient in the asthmatic powders or cigarettes. Habitual and continued use may cause irritation of the throat and bronchi and



render the patient more susceptible to attacks. Hyoscyamus is employed as tincture 15 to 30 M.

Drugs derived from opium act primarily on the nervous system as depressants and analgesics. They are dangerous in allergy and are to be avoided due to their habit formation. They are to be employed only in severe cases of asthma or migraine, morphine by injection,  $\frac{1}{8}$  to  $\frac{1}{4}$  grain, codein by mouth,  $\frac{1}{8}$  to  $\frac{1}{2}$  grain, dilaudid, 1/48 to 1/24 grain, dionin,  $\frac{1}{4}$  to 1 grain, and cocain for local application in 2 to 3 per cent solution. The patients' intolerance or sensitiveness to any of these drugs must be constantly kept in mind. Aspirin in 5 to 10 grain doses, if no contraindication exists, may give relief in asthma or allergic coryza.

Barbiturates, chloral and bromides are indicated for their sedation in paroxysmal attacks. Iodides have a salutary effect to liquefy and loosen the bronchial secretions and should be used orally, avoiding the condition of iodism. Lobelia in form of tincture 5 to 15 M. may be used in combination with iodides. Mild attacks of asthma are benefited by giving caffeine  $\frac{1}{2}$  grains; theobromine  $\frac{5}{8}$  grains and theophylline 3 to 5 grains orally. Acute asthmatic paroxysms have been relieved by intravenous administration of aminophyllin  $7\frac{1}{2}$  grains in 10 cc. physiological saline solution. Calcium although extensively employed has doubtful value. Endocrine therapy is indicated in conditions associated with endocrine deficiencies. Estivin, a preparation of *Rosa gallica* or a variety of sweetbrier, is employed for relief of conjunctivitis accompanying hay fever. Occasionally auto hemotherapy may be of value. Intravenous injections of histamine have not been productive of (0.1 to 0.5 mgm.) valuable results. The same holds true in our experience with histaminase or Torantil.

Ergotamine tartrate (also called Gynergen) is employed with successful results in cases of migraine. The injection of from 0.25 to 0.5 mgm. is given subcutaneously or intramuscularly. The earlier it is administered in an attack, the more prompt the relief. It is thought that its action is accomplished by relaxing the cerebral vascular spasm and paralyzing the motor sympathetics. Potassium chloride, 10 drops of a saturated solution three times daily may be of some limited value.

One must not overlook the use of mechanical, electric and chemical means employed with variable results. Among these is nasalization or iontophoresis, local applications of phenol and tannic acid, roentgen ray and radium exposures.

#### SUMMARY

To recapitulate, it may be said truly that in allergy one is dealing with manifestations of symptoms and pathology of the skin and its contents. When treating a patient, the physician, whether he is a general practitioner or one confining himself to a specialized field in medicine, must constantly be on the alert and watch for the possibility of the complaint being an allergic condition. To begin

with the head, there is the clinically recognized migraine with all its disabling disturbances. The eyes may present a great variety of symptoms. The allergic reaction may produce swelling of the retina and its vessels with manifestations of photophobia, scotomata, diplopia, hemianopsia or temporary blindness. Acute and chronic as well as vernal conjunctivitis with their syndromes of redness, itching and lacrimation are comparatively frequent. Corneal ulcers have been reported. Cataract, especially in young individuals, has been shown to be due in some cases to allergy. In the ear, eczema of the external auditory canal and Meniere's syndrome as well as tinnitus aurium have been found to have origin in food allergens. The nose reacts by developing mucous polyps, paroxysmal attacks of sneezing, rhinorrhea or nasal obstruction, and itching, designated as seasonal hay fever or perennial allergic rhinitis.

In the chest, the individual developing paroxysmal attacks of wheezing, whistling, tightness, dyspnea and cough with expectoration of tenaceous, white, foamy material is said to be suffering from bronchial asthma.

The primary factor of cardiac arrhythmias with ventricular extrasystole as well as true cardiac asthmas, angina pectoris and coronary occlusion may be allergy.

Reactions in the gastro-intestinal tract may simulate practically every disturbance known and sometimes unfortunately for the patient may result in unnecessary abdominal surgery. Nausea, vomiting (the vomitus may even be bloody) diarrhea, cramps, distention and mucous colitis are the manifestations.

Dysmenorrhea and menstrual irregularity may be due to allergy. Also such conditions as enuresis, tenesmus and painful urination, renal colic, balanitis and vulvar irritation have been encountered.

Diseased conditions strongly pointing to the etiological factor being allergenic but not fully proven are: thrombo-angiitis obliterans, arthritis, essential hypertension, agranulocytosis and periarteritis nodosa.

Finally, the skin reacts in allergy by developing urticaria, dermatographism, angioneurotic edema, pruritus, acne, erythema multiforme, purpura and occasionally in psoriasis.

Allergy is a large and extremely interesting subject and one could talk indefinitely citing all kinds of cases but the final chapter has not been written about it yet. I did not touch on bacterial allergy because it brings us in proximity to the subject of immunity. That one may be sensitized to pathogenic organisms, their products of metabolism and their toxins has been proven. But it is a serious undertaking to experiment with a pathogen. What about the erythema and eruptions present in diseased conditions due to viruses as measles, chicken pox, German measles or streptococci as in scarlet fever? The skin manifestations are certainly not due to the elevated temperature. Could it possibly

be an allergic reaction to the presence of the causative organism?

Allergy has its peculiarities. When treating a dermatophytosis (or fungous infection) of the feet and there is also an eruption on the hands or forearms, the latter may be a dermatophytid. Dermatophytids are simply allergic reactions to the original infection and no matter how severe, they may respond to hyposensitization.

Hay fever and asthma are rare among pure blooded American Indians. McInnis reported only five cases of asthma among 7,000 inmates of insane asylums. Transmission of allergy to the offspring is more frequent through the female.

In conclusion, let me state that the subject of allergy, no matter how it is intertwined with the subjects of anaphylaxis and immunity, is here to stay. It is a vast field and although confusing at times, it traverses the whole of the human body, its entire anatomy, physiology and pathology. In the study and applications of allergy, the physician needs a mastery of medical knowledge.

4700 Gravois Ave.

## CASE REPORT

### TRAUMATIC GANGRENE OF TOES (TRAUMATIC GLYCOSURIA PRESENT) TREATED BY SUNLIGHT

J. A. HARTMANN, M.D.

ST. LOUIS

The treatment in this case of traumatic gangrene of the toes with traumatic glycosuria present consisted of hot saline baths, packs and exposure to direct rays of the sun. Ultraviolet light was used on cloudy days.

#### REPORT OF CASE

H. K., white male, aged 48, 5 feet, 8½ inches tall, weighing 145 pounds, was factory maintenance man. His father died at 76 of cancer of the stomach and his mother at 62 years of cerebral apoplexy. Three brothers, aged 55, 28 and 32, are living and one brother died by accident.

*Previous History.*—No history of childhood diseases. Beginning May 15, 1936, patient received medical treatment for gastric ulcer after complete gastrointestinal examination. He was hospitalized for three months with complete recovery and has had no recurrence.

*Present History.*—On June 2, 1938, patient was repairing piston rod on an elevator engine. The cog of the crank shaft came down with terrific force and crushed all of the toes and distal ends of the metatarsal bones of the left foot.

The injured parts were cleansed hastily and hemorrhage from laceration in the left small toe was controlled. Patient was removed to the hospital and 1,500 units of tetanus antitoxin were administered. Roentgenograms of the left foot showed evidence of comminuted fractures of all five toes. The second phalanges were the main bones comminuted. The only compound comminuted fractures were of the left small toe; the

inner side of this toe was lacerated. All the toes were like flail joints. The skin of the entire left foot showed marked ecchymosis and the foot was swollen to twice its normal size. The circulation was entirely destroyed in all five toes as the toes were cold. The patient was placed in bed with Balkan frame and the left leg and foot, resting on a Hodgen splint, were elevated to about 40 degrees. The left foot and lower third of the left leg were covered with hot saline gauze packs and an infra-red lamp was placed about eighteen inches above to keep the dressing warm. The left foot was taken off the Hodgen splint and placed in a hot saline bath for fifteen minutes after which it was again put back on the Hodgen splint and raised to about 40 degrees. This treatment was repeated every thirty minutes for twenty-four hours. At the end of twenty-four hours it was noticed that collateral circulation was restored partly and the toes had assumed a slight degree of heat.

On June 2 the blood pressure was 160/94. One half grain codeine sulphate was given orally to control the pain. Urine showed sugar and 10 units U. 40 insulin were given. The insulin was given every morning in diminishing doses until departure from the hospital on July 15, 1938.

On June 3 pulsation was discovered in the toes and the toes seemed to become warmer. Eight hour intake was 970 cc., output 350 cc.

On June 4 hot saline foot baths lasting from fifteen to twenty minutes every four hours during the twenty-four hours were begun. Twenty-four hour intake was 1,800 cc., output 1,350 cc. Blood sugar test showed 0.107 per cent. On the following day Wassermann and Kahn tests were negative. Blood sugar was 0.083 per cent.

On June 13 the left foot was exposed to direct rays of the sun after applying sterile vaseline to the skin of the foot and lower third of the leg which was raised to a horizontal position. Gauze was used as protection against insects. It was noticed that the ecchymotic skin showed evidence of bleaching and the swelling of the foot was subsiding. The first treatment by sun rays lasted thirty minutes with no evidence of burns or other irritation of the skin of the exposed parts. Exposures were prolonged to one hour morning and afternoon without applying the vaseline. Throughout the treatment by exposures to the sun there was no evidence of burns. Patient felt that this treatment was beneficial because he could sleep better at night, had little or no pain and had a better appetite. During the period of daily exposures to direct rays of the sun it was noticed that the drainage became less each day and that the secretion lost its offensive odor. On June 10 the line of demarcation was distinct as shown in figure 1.

On June 26 roentgenograms showed no evidence of callus formation in any of the fractured toes. I then decided to amputate the toes and save as much bony tissue as possible. The exposure to direct rays of the sun was prolonged to one and one half hours each morning and afternoon without any evidence of injury to the skin.

On July 3 superficial dissection of gangrenous tissue was performed to determine the depth of the gangrenous tissue. This was done without local or general anesthesia and was practically painless. The gangrene was superficial. Five days later more superficial necrotic tissue was dissected with no anesthetic. On July 13 parts of the third and fourth toes were amputated without anesthesia with little inconvenience to the patient.

On July 15 the patient was allowed to leave the hospital. Temperature was 98 F., pulse 74, respiration 14, no glycosuria. Thereafter the patient applied the hot saline foot baths and packs to the foot at his home without confinement to bed. He was conveyed to my office every other day for treatment and dressings.





Fig. 1. The toes of left foot ten days after injury showing line of demarcation of gangrene.

On July 19 the second toe was amputated under local anesthesia of 2 per cent novocain. The parts distal to the fracture were removed without attention to the proximal end of the fractured phalanx and just enough was removed to insure a good protective stump. Wound healed by granulation and the result was good.

On July 30 the great toe was amputated with 2 per cent novocain anesthesia. The distal phalanx was removed and the two comminuted small bones of the second phalanx were removed after the amputation by taking out the two small fragments (fig. 2c). This was done to insure a better stump and better foundation for walking. The wound healed nicely without skin grafts. The after-treatment consisted of local application of 10 per cent scarlet red ointment, zinc oxide ointment and eburol. The hot saline baths and packs were discontinued. The small toe which showed the only compound comminuted fracture was not removed even after the last roentgenogram showed lack of calcium formation. The patient was given bone-forming drugs, i. e., calcium diphosphate, cod liver oil and iron to hasten the callus formation. There were no subjective symptoms in the small toe. In amputation of the part of the great toe, it was extremely difficult to anesthetize the deeper tissues because of the density of the tissues from loss of connective tissue spaces. The consistency of the skin and deeper tissues was like cartilage. This was evidently due to cicatrization from the original trauma. After amputation the stump healed nicely by application of 10 per cent scarlet red ointment and later soothing ointments as zinc oxide and eburol without skin graft. The result was a good stump covered with new skin and satisfactory for walking.

After leaving the hospital on July 15, 1938, the Hodgen splint was discontinued and the patient was allowed to wear a cut-out slipper and walk by putting most of his weight on the heel. As he became accustomed to walk-



Fig. 2. A. Roentgenogram taken soon after injury. B. Roentgenogram after amputation of parts of third and fourth toes. C. Roentgenogram after amputation of part of second toe. D. Roentgenogram taken after amputation of part of great toe and showing stumps of all four amputations.

ing, he was told to wear a cut-out shoe and within a week he walked very well but with a slight limp.

This patient was discharged on October 1, 1938, and since that time has been doing his regular duties without inconvenience and has no evidence of limp in his gait. I saw him last on January 1, 1939.

While in training in the Medical Reserve Corps of the Army during the World War, in a special course in military surgery, we were advised that if there were any evidence of gangrene combined

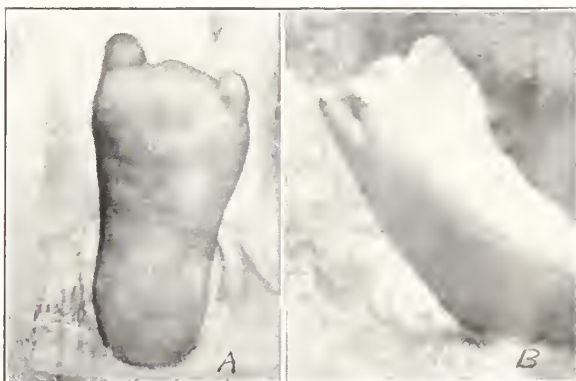


Fig. 3. A. Photograph showing plantar surface of foot after complete healing of all stumps and also showing the small toe and the stump of the great toe. B. Photograph showing dorsal side of foot after complete healing of amputated stumps.

with glycosuria and especially if a line of demarcation was present, to amputate immediately and far enough away. In this case it would have been about the upper third of the left leg. I found by dissection of the gangrenous tissue that the gangrene was only superficial and that the glycosuria was of a transient nature.

The only literature I was able to find pertaining to sunlight treatment of surgical cases was an article in *Surgery, Gynecology and Obstetrics*, September, 1932, by Drs. Frank B. Corrigan and William Boukalik, Cleveland. Their experience was gained while practicing in the Atacama Desert in Northern Chile. This is a region of intense sunlight and practically no rain. Of course our latitude and our climate are different. An electric apparatus supplies ultraviolet rays which approximate the natural sun rays and can be used on cloudy days.

I am sure that sunlight treatment is useful in the average surgical condition caused by trauma and in certain operative cases. My interest in this inexpensive treatment of surgical wounds was stimulated by the results obtained in the case I have reported although I am aware that this is only one case. From the experience and the result obtained in this one case, I would not hesitate to use this method on any kind of injury involving tissue or bone and in future cases will resort to this method of treatment earlier than I did in this case. In this case, I had no authority as I was not aware at the time of a precedent in the literature and did not know the extent of damage that could have resulted from the sun treatment.

It occurs to me that the wonderful results obtained with live maggots in exposed gunshot wounds during the late war and even the Civil War, in victims who were found after several days exposure to the elements and the wounds which were infected and infested with maggots after being cleansed and further debridement done soon healed and the patient recovered, were caused by the sunlight exposure saving the parts and the maggots doing the debridement.

According to an editorial in the *Journal of the American Medical Association*, April 22, 1939, "Trauma and Diabetes," a traumatic origin of diabetes was recognized by Van Noorden in 1898. At that time physicians thought that traumatic diabetes actually existed and that it was a neurogenic diabetes due to trauma in the central nervous system.

602 Century Building.

#### PUBLIC SERVICE OF A. M. A.

The constantly increasing service of the American Medical Association to the public and to medicine is revealed in the reports of officers of the Association, published in the May 11 issue of *The Journal of the Association*.

Evidence of the solidarity of the medical profession

is contained in the membership figures. The secretary reports that as of March 1, 1940, there were 115,381 members, a gain of 3,171 over the total of the previous year.

A total of seventy-one grants in aid of research were made in 1939 by the Association.

The net cost of publication of seven special journals published by the Association, of *Hygeia*, *The Health Magazine* and of the Quarterly Cumulative Index Medicus, which is an index of the best medical literature of the world, exceeded income received by the sum of \$75,947. The index is recognized as a distinct contribution to scientific medicine.

The activities of the Association in promoting the health of the people through sound health education are reflected to some extent in the report on *Hygeia*. The total circulation of the magazine was in excess of 110,000, a net paid increase of 7,588 over that of the year before. Gains in circulation also are reported for *The Journal of the Association* and the special journals.

The library of the Association distributed 2,993 library packages and lent 12,714 periodicals. Bibliographic aid was given in response to 6,000 requests and the facilities of the library were utilized by 1,545 visitors during the year.

Among the important activities of the Council on Pharmacy and Chemistry were investigations in its laboratory of the properties and uses of sulfanilamide and sulfapyridine, standards for the latter being established during the year.

Among principal activities of the Council on Foods were investigations and reports on the need for the addition of vitamin B<sub>1</sub> to staple foods, the loss of vitamin C in orange juice on standing, vitamin mixtures, claims for food products rich in certain vitamins, lead in foods, the fluorine content of foods and the fortification of foods with vitamins and minerals.

Investigations in the fields of audiometers and hearing aids, inhalators and resuscitators, "fever treatment" apparatuses and radio interference said to be caused by electromedical equipment, were among the activities of the Council on Physical Therapy.

An educational campaign is being conducted by the Council on Industrial Health, features of which include the Annual Congress on Industrial Health sponsored by the Council.

The increasing effectiveness of the Association's work in further the high standards of medical education for students as well as postgraduate education for the practicing physician, is reflected in the report of the Council on Medical Education and Hospitals.

During the year the Bureau of Health Education handled 19,660 pieces of mail, in the course of which it answered more than 10,000 letters from laymen.

Studies and reports on arrangements for the distribution of medical care and on group hospitalization plans were among the activities of the Bureau of Medical Economics. It reports that at present at least fourteen state medical societies have statewide arrangements for medical care in various stages of development or operation and that at the close of 1939 there were 108 group hospitalization organizations in operation in thirty-five states and in the District of Columbia.

The Bureau of Investigation continued to increase the amount of information furnished on "patent medicines," charlatans and frauds to physicians, laymen, government agencies, better business bureaus, business corporations, newspapers, radio stations and other groups.

The Bureau of Exhibits reports that in 1939, 200 exhibits were shown in various cities in the United States and Canada in addition to those being maintained at the New York World's Fair and the Golden Gate International Exposition. Its other activities include motion pictures for the use of medical and other scientific groups.



# THE JOURNAL

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JUNE, 1940

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## EDITORIALS

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### THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.
2. The allotment of such funds as the Congress may make available to any state in actual need for the prevention of disease, the promotion of health and the care of the sick on proof of such need.
3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.
4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.
5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.
6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.
7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.
8. Expansion of public health and medical services consistent with the American system of democracy.



ROBERT B. DENNY, M.D.

PRESIDENT-ELECT, MISSOURI STATE MEDICAL  
ASSOCIATION, 1940-1941

Dr. Robert B. Denny, Creve Coeur, was elected President-Elect of the Missouri State Medical Association by the House of Delegates at the Joplin Session, April 29, 30 and May 1. Dr. Denny will serve as President-Elect during this year and will be installed as President at the St. Louis Session in 1941.

Dr. Denny was born in Lone Dell, Franklin County, Missouri. He attended high school at Washington, Missouri, then the Northeast Missouri State Teachers College at Kirksville. He received his B.S. degree from the Southeast Missouri State Teachers College, Cape Girardeau, in 1893. He taught school in St. Louis County for four years, becoming Superintendent of the Schools of St. Louis County in 1897 and serving in that capacity for two terms.

Soon after beginning his study of medicine in the Marion-Sims College of Medicine, Dr. Denny was elected to the legislature and served in the House in 1893-1894 while continuing his study of medicine. He served on the Committee on Public Health in the House. In 1903 he received his medical degree from the Barnes Medical College. He began his practice in Eureka and in 1912 moved to his present location in Creve Coeur. He served St. Louis County as coroner from 1916 to 1920.

Dr. Denny became a member of the Missouri State Medical Association in 1904. He served the St. Louis County Medical Society as president early

in his career and was again president in 1930 and was reelected in 1931. He served as delegate to the Annual Sessions in 1927, 1928 and 1929. He was elected Councilor of the Thirtieth Councilor District (St. Louis County) at the 75th Annual Session at Jefferson City in 1932 and served until April 1937 when the councilor districts were changed and St. Louis County became a part of the Fourth Councilor District, composed of Franklin, Jefferson, Lincoln, St. Charles, Warren and St. Louis counties. Dr. Denny served as Councilor of the Fourth Councilor District until he resigned at the Joplin Annual Session when he was elected President-Elect of the Association. He is a Fellow of the American Medical Association.

Dr. Denny has been a member of the Association since a short time after the reorganization of the Association to conform with the Constitution and By-Laws of the American Medical Association. He is intimately acquainted with the growth and development of the Association as well as its problems and the members again can be proud of their selection of their President-Elect.

#### THE JOPLIN SESSION

The 83rd Annual Session of the Missouri State Medical Association, which convened in Joplin, April 29, 30 and May 1, was one of its most valuable annual sessions. The scientific program was practical and instructive and each general meeting was well attended. The business of the House of Delegates was conducted with dispatch and harmony.

Dr. James R. McVay, Kansas City, opened the session of the House of Delegates and presided at the scientific sessions. Dr. M. Pinson Neal, Columbia, was elected Speaker of the House of Delegates and presided at the meetings of that body. Dr. Cyrus E. Burford, St. Louis, was installed as President at the Wednesday afternoon session of the House of Delegates and will preside at the 1941 Session which will convene in St. Louis.

Dr. R. B. Denny, Creve Coeur, was elected President-Elect and will be installed as President at the St. Louis Session and will preside at the meeting in 1942. Drs. L. J. Schofield, Warrensburg; William J. Stewart, Columbia, and Paul W. Walker, Joplin, were elected Vice Presidents.

Drs. A. R. McComas, Sturgeon, and H. L. Kerr, Crane, were reelected Delegates to the American Medical Association. Drs. E. Lee Miller, Kansas City, and A. S. Bristow, Princeton, were elected alternate Delegates.

Dr. Walter Baumgarten, St. Louis, was re-appointed Editor; Dr. Ralph L. Thompson, St. Louis, Treasurer, and Mr. E. H. Bartelsmeyer, St. Louis, Executive Secretary. Dr. Curtis H. Lohr, St. Louis, was reelected Chairman of the Council and Dr. W. A. Bloom, Fayette, Vice Chairman. Terms of Councilors of the odd numbered districts expired this year and Councilors were elected by the dele-

gates present from the various districts as follow: First District, Dr. A. S. Bristow, Princeton, reelected; Third District, Dr. Curtis H. Lohr, St. Louis, reelected; Fifth District, Dr. W. A. Bloom, Fayette, reelected; Seventh District, Dr. F. I. Wilson, Kansas City; Ninth District, Dr. E. C. Bohrer, West Plains, reelected.

On Monday evening Past Presidents of the Association were honor guests at a dinner attended by approximately three hundred members of the Association and the Auxiliary. Dr. Alphonse McMahon, St. Louis, Vice President of the American Medical Association, spoke on "The Medical Profession, Its Aims and Responsibilities" in place of Dr. Nathan B. Van Etten, New York, President-Elect of the American Medical Association, who could not attend the Session because of illness. Dr. James R. McVay, Kansas City, President, presided at the dinner. Drs. Curtis H. Lohr and Cyrus E. Burford, St. Louis, and Morris B. Simpson and Herbert L. Mantz, Kansas City, discussed problems of the medical profession.

Round table luncheon meetings on Tuesday and Wednesday of the Session furnished opportunity for guest speakers to answer questions of members. Both meetings were well attended and the discussions valuable. The Committee on Maternal Welfare and Infant Care held its annual meeting Monday noon at which reports of maternal deaths and obstetrical problems were discussed.

The Jasper County Medical Society proved itself a most hospitable and excellent host throughout the Session. On Tuesday evening the Society was host at a buffet dinner and entertainment for members of the Association.

Scientific and commercial exhibits added materially to the value of the Session.

Dr. Cyrus E. Burford, St. Louis, following his installation as President, made the following appointments to committees: Scientific Work, Dr. James E. Stowers, Kansas City, Chairman, Dudley S. Conley, Columbia, and Stanley P. Howard, Jefferson City; Postgraduate Course, Drs. M. Pinson Neal, Columbia, and G. T. Bloomer, St. Joseph; Public Policy, Drs. R. Emmet Kane, St. Louis, R. M. James, Joplin, and Donald M. Dowell, Chillicothe; Defense, Drs. O. B. Zeinert, St. Louis, and L. P. Forgrave, St. Joseph; Medical Education and Hospitals, Drs. Goronwy O. Broun, St. Louis, and Sam A. Grantham, Joplin; Cancer, Drs. William E. Leighton, St. Louis, and F. G. Thompson, St. Joseph; Medical Economics, Drs. E. L. Johnston, Concordia, and C. A. W. Zimmermann, Cape Girardeau; Mental Health, Drs. B. Landis Elliott, Kansas City, Chairman, and Frank M. Grogan, St. Louis; Maternal Welfare and Infant Care, Drs. E. Lee Dorsett, St. Louis, John Aull, Kansas City, Irl B. Krause, Jefferson City, and W. Roger Moore, St. Joseph; Health and Public Instruction, Drs. Victor E. Scherman, St. Louis, Frank G. Nifong, D. A. Robnett and A. J. Durant, V. M. D., Columbia; Constitution and



By-Laws, Drs. Floyd H. Spencer, St. Joseph, and Otto W. Koch, St. Louis; Fractures, Dr. James D. Horton, Springfield; Conservation of Eyesight, Drs. Winfred L. Post, Joplin, Chairman, Philip S. Luedde, St. Louis, Robert S. Minton, St. Joseph, George A. Hornback, Hannibal, G. J. Tygett, Cape Girardeau, C. R. Bruner, Columbia, and C. Souter Smith, Springfield; Control of Venereal Disease, Drs. G. V. Stryker, St. Louis, Chairman, and V. Rogers Deakin, St. Louis; Industrial Health, Drs. E. C. Funsch, St. Louis, Chairman, J. E. Castles, Kansas City, W. M. Kinney, Joplin, H. I. Spec-  
tor, St. Louis, and G. T. Bloomer, St. Joseph; Physical Therapy, Drs. William J. Stewart, Columbia, and John L. Washburn, Versailles; Study of Medical Practice Laws, Drs. J. Milton Singleton, Kansas City, Chairman, Lee D. Cady, St. Louis, T. W. Cotton, Van Buren, E. D. James, Joplin, O. C. Gebhart, Oregon, M. Pinson Neal, Columbia, and E. L. Spence, Kennett; Medical Legal Affairs, Dr. Downey Harris, St. Louis; Tuberculosis, Drs. E. E. Glenn, Springfield, Chairman, George D. Kettelkamp, Koch, and R. H. Runde, Mt. Vernon; Rural Medicine, Drs. H. A. Lowe, Springfield, Chairman, T. W. Cotton, Van Buren, and James A. Logan, Warsaw; Medical Military Affairs, Drs. William J. Shaw, Fayette, Chairman, Charles D. Osborne, Sedalia, D. D. Stofer, Kansas City, James E. Stowers, Kansas City, and W. E. Stone, Boonville; Adviser to Woman's Auxiliary, Dr. H. L. Mantz, Kansas City.

The Council appointed the Committee on Publication as follows: Drs. Walter Baumgarten, St. Louis, Chairman; Richard B. Schutz, Kansas City; M. H. Shelby, Cape Girardeau; G. B. Lemmon, Springfield; R. C. Haynes, Marshall.

#### AMERICAN MEDICAL ASSOCIATION NEW YORK SESSION

The American Medical Association will convene for the ninety-first Annual Session in New York, June 10 to 14. The House of Delegates will convene at 10:00 a. m., Monday, June 10. The scientific assembly of the Association will open with the general meeting to be held at 8:00 p. m., Tuesday, June 11. The sections will meet Wednesday, Thursday and Friday, June 12, 13 and 14.

The bureau of registration will be located on the second floor of the Grand Central Palace, Lexington Avenue, between 46th and 47th streets. Officers of the American Medical Association and members of the House of Delegates may register for the scientific assembly in the Basildon Room in the Waldorf-Astoria. The House of Delegates will convene in the Jade Room of the Waldorf-Astoria. The opening general meeting will be held in the Grand Ballroom of the Waldorf-Astoria and the general scientific meetings in the Grand Ballroom of the Waldorf-Astoria and the Grand Ballroom of The Commodore. General headquarters, scientific exhibit,

registration bureau, technical exhibits, information bureau and branch postoffice will be in the Grand Central Palace.

A dinner and entertainment for members of the House of Delegates and officers has been planned at the New York World's Fair for Monday evening and a luncheon planned on Tuesday. The President of the Association will be honored with a reception and ball on Thursday evening in the Grand Ballroom of the Waldorf-Astoria.

Dr. A. R. McComas, Sturgeon; Dr. H. L. Kerr, Crane; Dr. R. Emmet Kane, St. Louis, and Dr. James R. McVay, Kansas City, will represent the Missouri State Medical Association in the House of Delegates.

Missouri fellows who will appear on the program are Drs. Philip A. Shaffer, A. N. Arneson, Arthur W. Proetz, Richard S. Weiss, Hyman J. Goldman, Grayson L. Carroll, V. Rogers Deakin, J. Albert Key, Frederick A. Jostes, Horace W. Soper, St. Louis; Frank D. Dickson, Buford G. Hamilton, George F. Pendleton, Hugh L. Dwyer, Kansas City. Missouri fellows who will present scientific exhibits are Drs. William B. Kountz, John R. Smith and Arthur S. Gilson; Willard Bartlett, Jr., and Robert W. Bartlett; Louis H. Jorstad and Bruce C. Martin, St. Louis; and William M. Kinney, Joplin.

#### AMERICAN MEDICAL GOLFING ASSOCIATION

The American Medical Golfing Association's twenty-sixth annual tournament will be held at Winged Foot Golf Club, Mamaroneck, New York, Monday, June 10. Winged Foot Golf Club has two famous championship courses and a beautiful clubhouse.

Approximately 250 of the 1,360 fellows of the A. M. G. A. are expected to take part in the 36-hole competition. Each contestant will play both courses. The hours for teeing off are from 7:00 a. m. to 2:00 p. m. Sixty prizes in nine events will be distributed after a banquet at the clubhouse at 7:00 p. m.

Officers of the A. M. G. A. for 1940 are Dr. G. W. Hall, Chicago, president; Dr. D. H. Houston, Seattle, first vice president; Dr. Grayson Carroll, St. Louis, second vice president; William Burns, 2020 Olds Tower, Lansing, Michigan, secretary.

All members of the American Medical Association are eligible for fellowship in the A. M. G. A. Registration applications may be obtained from the secretary.

#### NEWS NOTES

Dr. E. Lee Dorsett, St. Louis, was elected president of the St. Louis Gynecological Society at the April meeting. Dr. Joseph A. Hardy, Jr., St. Louis, was elected secretary.

Dr. Norman Tobias, St. Louis, addressed the Franklin County (Illinois) Medical Society at Benton, Illinois, May 2, on "Management of the Common Skin Diseases."

The Trudeau Club of St. Louis held its last meeting of the season at the Robert Koch Hospital, Koch, on May 2, with Drs. William Stanbro, Paul Murphy, L. M. Shefts and I. J. Flance appearing on the program.

Dr. Mary J. Lower, Kansas City, was presented an award of honor by the Soroptimist Club of Kansas City at a banquet on May 6. Dr. Lower is the third woman in Kansas City to receive this award. Dr. Lower has practiced medicine in Kansas City for many years and has been active in club and philanthropic work. She is a charter member of the Soroptimist Club in Kansas City.

Abbott Laboratories, Chicago, has established several fellowships in organic chemistry and biochemistry for the year 1940-1941. The recipients are to be selected by the universities in which their work is being done. The object of the fellowships is to provide means for the carrying on of additional scientific work in American universities and lending encouragement to study in these fields.

If you know of patients who have suffered injurious effects from the use of proprietary remedies containing desiccated thyroid, recommended or sold for obesity, or injurious results from indiscriminate use of desiccated thyroid in amounts of two grains or less per day, please report such cases to the headquarters office of the Missouri State Medical Association, 623 Missouri Building, St. Louis.

Dr. August A. Werner, St. Louis, delivered two addresses under the auspices of the Postgraduate Committee of the Iowa State Medical Society at Marshalltown, Iowa, May 7, and at Ames, Iowa, May 8. His subject was "The Anterior Pituitary Gonad Relationship in the Female." He presented the same address before the Central District Medical Society at Davenport, Iowa, on May 16.

The old autopsy house where Osler worked at Blockley has been restored as the Osler Memorial Building and will be dedicated on the grounds of the Philadelphia General Hospital, Philadelphia, at 2:00 p. m., June 8. Original furnishings, including the necropsy table, have been collected. The painting by Dean Cornwell, "Osler at Old Blockley," later to be hung in the building, will be on exhibit during the celebration. There are facilities in the building for housing and preservation of relics of old Blockley as well as Osleriana and the committee would welcome any additions to the collection. Physicians are cordially invited to attend the dedication.

Dr. Edward H. Skinner, Kansas City, was a guest of the Oklahoma State Medical Association and presented several addresses at the annual session in Tulsa, May 6, 7 and 8. His subjects were "History of Roentgenology," "Management of Accessible Cancer of the Uterine Cervix by Radium Therapy," "National Physicians' Committee for Extension of Medical Service," "A Radiologist Observes Fracture Treatment" and "Simplified Radiation Therapy for Cancer of the Skin and Lip."

Dr. Alphonse McMahon, St. Louis, Vice President, American Medical Association, was a guest of the Iowa State Medical Society at its annual session in Des Moines, May 1, 2 and 3, and presented an address before a general session on May 3. Dr. McMahon was a guest of the Oklahoma State Medical Association at its annual session in Tulsa, May 6, 7 and 8. In the general scientific sessions he gave addresses on "The Effect of Aminophylline on the Electrocardiogram," "Emergency Treatment of Acute Heart Failure" and "Group Hospital Insurance." Before a public meeting he spoke on "The Medical Profession, Its Aims and Responsibilities."

Dr. A. R. McComas, Surgeon, was honored on the occasion of his fiftieth anniversary in the practice of medicine at a picnic sponsored by the Boone County Medical Society at The Pinnacles, Boone County, on May 22. Friends throughout Missouri and from out of the state attended. During his years of practice Dr. McComas has served the Missouri State Medical Association diligently in many capacities. He was elected Councilor of the former 9th District and served in that capacity until his election as President of the Association in 1922. He served as Chairman of the Council from 1916 to 1937. He has been a Delegate to the American Medical Association since 1932 and was reelected at the 1940 Session to serve during 1940 and 1941. He has been a delegate to the Annual Sessions several times. He served as president of the Boone County Medical Society in 1934. During the World War he was commissioned a captain and served in the Post Hospital at Fort Leavenworth. Dr. McComas was born in Sturgeon, the son of a physician, a pioneer in Central Missouri, and after completing his medical education at the Beaumont Hospital Medical College in St. Louis, he entered practice in Sturgeon with his father.

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Nonofficial Remedies:

Abbott Laboratories

Ampoules Ephedrine Sulfate—Abbott, 0.025 Gm. (3/8 grain), 1 cc.

Ampoules Gold Sodium Thiosulfate—Abbott, 0.075 Gm.



Lakeside Laboratories, Inc.

Ampules Caffeine with Sodium Benzoate—Lakeside, 0.24 Gm. ( $3\frac{3}{4}$  grains), 2 cc.

Ampules Caffeine with Sodium Benzoate—Lakeside, 0.49 Gm. ( $7\frac{1}{2}$  grains), 2 cc.

The Drug Products Co.

Hyposols Dextrose 10 Gm. (Buffered) 20 cc.

Hyposols Dextrose 25 Gm. (Buffered), 50 cc.

Mallinckrodt Chemical Works

Urea Pure Crystals—Mallinckrodt

Maltbie Chemical Co.

Ampuls Sodium Cacodylate—Maltbie 0.1 Gm. ( $1\frac{1}{2}$  grains), 1 cc.

Ampuls Sodium Cacodylate—Maltbie 0.2 Gm. (3 grains), 1 cc.

Ampuls Sodium Cacodylate—Maltbie 0.325 Gm. (5 grains), 1 cc.

Ampuls Sodium Cacodylate—Maltbie 0.5 Gm. ( $7\frac{1}{2}$  grains), 5 cc.

Ampuls Sodium Cacodylate—Maltbie 1.0 Gm. ( $15\frac{1}{2}$  grains), 5 cc.

Merck & Co., Inc.

Sulfapyridine Sodium Monohydrate—Merck

E. S. Miller Laboratories, Inc.

Compressed Tablets Sulfanilamide—Miller, 5 grains

Parke, Davis & Co.

Kapseals Theelol, 0.24 mg.

Sandoz Chemical Works, Inc.

Digilanid

Tablets Digilanid,  $\frac{1}{3}$  mg. (1 cat unit)

Digilanid Liquid,  $\frac{1}{3}$  mg. per cc. (1 cat unit)

Sharp & Dohme

Elixir Propadrine Hydrochloride

E. R. Squibb & Sons

Amniotin in Oil, 5,000 International Units

Ephedrine Alkaloid—Squibb

Ephedrine Compound Inhalant—Squibb

Ephedrine Inhalant Plain—Squibb

Ephedrine Sulfate—Squibb

Capsules Ephedrine Sulfate—Squibb,  $\frac{3}{8}$  grain

Capsules Ephedrine Sulfate—Squibb,  $\frac{3}{4}$  grain

Tablets Thiamin Chloride—Squibb, 10 mgms.

Tablets Thiamin Chloride—Squibb, 3 mgms.

Thiamin Chloride Solution, 5 cc., 10 mgms.

Thiamin Chloride Solution, 5 cc., 25 mgms.

Thiamin Chloride Solution, 5 cc., 50 mgms.

Thiamin Chloride Solution, 10 cc., 10 mgms.

Sulfapyridine—Squibb

Capsules Sulfapyridine—Squibb, 0.25 Gm. (3.38 grains)

Tablets Sulfapyridine—Squibb, 0.5 Gm. (7.7 grains)

Frederick Stearns & Co.

Stearns Cod Liver Oil

The Upjohn Company

Ampoules Bismuth Subsalicylate with Chlorobutanol in Oil, 1 cc.

Bismuth Subsalicylate with Chlorobutanol in Oil, 30 cc. Vials

White Laboratories, Inc.

White's Thiamin Chloride Tablets, 1 mg.

Winthrop Chemical Co., Inc.

Ampules Pontocaine Hydrochloride "Niphanoid"

For Spinal Anesthesia, 10 mg.

Ampules Pontocaine Hydrochloride "Niphanoid"

For Spinal Anesthesia, 20 mg.

## ORGANIZATION ACTIVITIES

### ACTIONS TAKEN AT THE JOPLIN SESSION

The following report and resolutions were adopted by the House of Delegates at the Joplin Session. They will be included in the proceedings which will be published in the July issue of THE JOURNAL.

#### Farm Security Administration

The Reference Committee on Medical Education and Public Welfare gave the following report, which was adopted.

A medical care plan for Farm Security Administration families in Madison County was referred to your Committee for consideration.

In the report of the Committee on Medical Economics submitted to and accepted by the House of Delegates at its first session Monday, we find the following:

"During the last year many county medical societies have studied and some have adopted the 'Pooling System' in caring for the clients of the Farm Security Administration. The Committee has not officially approved any of these plans because the House of Delegates of the Missouri State Medical Association has not adopted any type of prepayment medical plan. The Committee merely has given assistance from the large amount of data in its files. The Committee feels the House of Delegates should give consideration and study to these plans."

At the 1937 Cape Girardeau Session the House of Delegates authorized county medical societies to cooperate with this federal agency at their own election or discretion. The following By-Law was adopted at the 1936 Session:

"Chapter XI, Section 11. The State Association, or a county society in manner approved by the State Association, may undertake and coordinate all sickness, care of indigents and low income groups through agreements with public officials, and with physicians and others and by the use of contributions, cooperative funds and other means, provided only that free choice of physicians within such agreements shall be retained and that responsibility of physician to patient and all other agreements and tort relationships with patient shall remain as though the dealings were direct between physician and patient."

We quote the following paragraph from the report of the Committee on Legislative activities of the American Medical Association made at the 1939 St. Louis Session:

"County plans for medical care are in operation in fifty-six of the seventy-five counties in Arkansas, twelve counties in Missouri, forty in Mississippi, twelve in Texas, twenty-six in Alabama, eighty-five in Georgia, seven in Ohio, five in Tennessee, two in Indiana, seven in Oklahoma, three in Iowa, four in New Mexico, three in Virginia, six in North Carolina, twelve in South Carolina, one in Montana, two in Idaho, fifteen in Louisiana, one in New Jersey and four in Florida, and plans have been made in some other states."

Your Committee feels that the plan submitted to us is in accord with the By-Laws of our Association. Further, we are informed the great majority of the plans now in operation in other states, as reported by the Committee on Legislative Activities of the American Medical Association referred to, operate on the pool plan. We therefore recommend that cooperation by and between the Farm Security Administration and county medical societies in providing medical care for clients of this Administration remain the responsibility and at the discretion of each respective county medical society of our Association, this action being in harmony with the authorization given by the House of Delegates at the Cape Girardeau Session. In order to secure uniformity of plans as may be adopted by the county medical societies at their election, it is recommended that county societies submit all such proposed plans to the State Association in accordance with the By-Law referred to.

#### Resolution on Cooperation in Public Health Activities

The following resolution was adopted by the House of Delegates:

WHEREAS, Due to the allocation of federal funds, there has been a great extension of the program and activity of the Department of Health of Missouri, and

WHEREAS, This enlarged program involves the private practice of medicine and the success and future of this program is of great importance to the citizens of Missouri, and

WHEREAS, There has been much confusion in the co-operation of the various agencies in the application of these activities, be it

*Resolved*, That a special committee of five members be appointed by the President of the Missouri State Medical Association to serve one year. The duties of this committee shall be to make a thorough study of the proposed plans and present activities of the Health Department of the State of Missouri and report their findings to the Council and House of Delegates. This committee shall also make such recommendations as appear to them necessary to develop a further degree of cooperation between the Missouri State Medical Association, the State Department of Health, local governmental agencies and private physicians so that any activities now in force or contemplated may be carried out to the best interests of all concerned.

#### Resolution on Conservation of Eyesight

The following resolution was adopted by the House of Delegates:

WHEREAS, The Committee on Conservation of Eyesight of the Missouri State Medical Association recognizes the need of an educational program throughout the country, and

WHEREAS, The Committee believes that the term "Conservation of Eyesight" carries broader implications than "Prevention of Blindness," and

WHEREAS, The Committee believes that other state medical associations should form similar committees, therefore be it

*Resolved*, That the Missouri State Medical Association requests the inauguration of such an educational program by the American Medical Association, and be it further

*Resolved*, That the Delegates from the Missouri State Medical Association to the American Medical Association be instructed to offer a resolution in the House of Delegates of the American Medical Association to the effect that a Committee on Conservation of Eyesight be formed as a committee of the American Medical Association to extend the educational program and to encourage the formation of such state committees.

#### WAGNER-GEORGE HOSPITAL BILL

Some of the provisions and shortcomings of the Hospital Construction Bill, reported favorably by the Senate Committee on Education and Labor on April 30, are discussed by *The Journal of the American Medical Association* in an editorial in its May 11 issue. *The Journal* says that the bill was reported out unanimously.

"The committee retained some of the provisions of the original Wagner-George bill, inserted some of the provisions of the Taft plan, and added other provisions of its own," *The Journal* says. "Some of the suggestions advocated by representatives of the American Medical Association and of hospital associations are found in the reported bill. The National Advisory Hospital Council will assume a more important role than was contemplated in the original Wagner-George bill only during the first year of the operation of the program, for only with respect to applications for hospital projects to be undertaken with appropriations to be made available during that year will the approval of the council be necessary.

"The bill still leaves in considerable doubt what disposition shall be made of hospital projects the leases for which shall have been canceled, but the fact that grants for maintenance are contemplated may minimize the probability of lease cancellations.

"The Senate Committee on Education and Labor in reporting this bill, said that the hospital building program was only a step toward the solution of health problems which have received the attention of the committee for the last several months. The program is designed to fit into a more comprehensive plan being formulated by the committee.

"The committee predicates its approval of the reported bill on its acceptance of the premise that it is a function of government to preserve the person as well as the property of man and that there can be no national progress except through promoting the health and welfare of the citizens of the nation."

#### THE STATE BOARD OF HEALTH

The annual meeting of the Missouri Public Health Association was held in Jefferson City May 23 to 25. Among the outstanding speakers were: Dr. Martha A. Eliot, Assistant Chief, United States Children's Bureau; Reverend Alphonse M. Schwitalla, St. Louis, Dean, St. Louis University School of Medicine; Dr. W. K. Sharp, Jr., Regional Medical Consultant, United States Public Health Service; L. C. Frank, Sanitary Engineer Chief, United States Public Health Service, and Mrs. George H. Hoxie, Kansas City. Public health workers throughout the state attended as well as a number of practicing physicians, teachers and welfare workers.

Through the cooperation of the Illinois State Department of Public Health and the United States



Children's Bureau, the Department of Obstetrics and Gynecology of the University of Chicago and the Chicago Lying-in Hospital are offering five to six weeks' postgraduate courses in obstetrics for practitioners during the next several months. The first three periods are set for April 29 to June 8; June 17 to July 20, and July 22 to August 24. Except for a deposit of \$25.00 (\$10.00 of which is returned at the completion of the course) the only expense to the individual will be that of his board and room and personal incidental expenses. Any graduate of a reputable medical school, licensed to practice in the State in which he resides will be eligible. Detailed information may be obtained by addressing: Postgraduate Course, Department of Obstetrics & Gynecology, 5848 Drexel Avenue, Chicago, Illinois.

The birth rate for last year in Missouri was the highest recorded since 1931 according to provisional statistics released recently by the State Board of Health. The 1939 rate was 16.35 per 1,000 population as shown by the provisional figures. The final tabulation will probably be slightly lower.

The death rate approached a new low with a crude rate of 10.86, slightly higher, however, than in 1938 when it was 10.67 per 1,000. This small increase in mortality can be attributed in the main to diseases of the older age groups as heart disease, cerebral hemorrhage, diabetes and nephritis. Death rates from the communicable diseases were generally favorable showing improvement in typhoid fever, measles, scarlet fever, whooping cough, diphtheria, pulmonary tuberculosis and others.

The leading causes of death for 1939 with the rates per 100,000 population were reported as follows: heart disease 265.20, cancer 126.17, nephritis 107.55, cerebral hemorrhage 89.20, pneumonia 74.96, all accidents 68.96, and all forms of tuberculosis 45.65.

New low records were established for infant and maternal mortality rates. Provisional returns for 1939 show an infant death rate of 43.48 per 1,000 live births against the previous low of 51.07 in 1938 and a maternal mortality rate of 3.42 against the 1938 low of 3.82.

State Health Commissioner, Dr. Harry F. Parker, pointed out that while the above improvements are encouraging, there are certain areas in the state in which excessive deaths still occur. Credit was given practicing physicians throughout the state who have assisted materially in attaining these results and to the statewide public health program which is directed to prevention rather than cure.

"Mortality statistics do not always portray the true state of a people's health," Dr. Parker asserted. "Many diseases and abnormalities are present among the people of this and every other state which do not kill but do disable and cause much suffering. Rickets, scurvy and pellagra were mentioned as deficiency diseases which seldom cause

death but seriously cripple individuals, particularly children. The State Board of Health is concerned as much with these conditions as with mortality rates."

As a public health program to reduce the incidence of fly-borne diseases, the State Board of Health is sponsoring a program for the construction and installation of sanitary fly-tight pit privies where public sewer systems are not available. This program has been made possible by the assistance of the Works Project Administration and has the endorsement of the United States Public Health Service. All property owners in areas not supplied with sanitary sewer systems are eligible. Any individual, dairy, farm, store, market, school, church, filling station, park or resort requiring a privy may have one under this program. The property owner furnishes materials only. Labor is supplied by the Works Projects Administration.

The new Jasper County Health Unit now has its program well under way. Although the unit's primary function is prevention, its program also embraces indigent medical care and two part time physicians are provided for this work. All but direct relief clients are required to obtain a statement from a private physician recommending them to the health unit for treatment. Tuesday, Thursday and Saturday mornings are given over to clinics and ambulatory indigent patients report there for examination and treatment. Provision is made in the budget for a part time venereal disease control officer. In addition to the full time medical officer and the part time physicians, the staff includes three public health nurses, a public health engineer and clerk. A large stucco building has been provided in Webb City for the offices of the health unit, furnishing adequate facilities for the extensive program.

## DEATHS

**Kitchell, Roy Calvin, M.D.**, Sullivan, graduate of the Chicago Medical School, Chicago, 1922; member of the Franklin County Medical Society; Fellow of the American Medical Association; aged 49; died March 9.

**Hauck, Julius, M.D.**, St. Louis, graduate of the St. Louis University School of Medicine, 1912; honor member of the St. Louis Medical Society; Fellow of the American Medical Association; aged 67; died April 5.

**Marks, Heine, M.D.**, St. Louis, graduate of the Cincinnati College of Medicine and Surgery, 1878; honor member of the St. Louis Medical Society; aged 81; died April 5.

**Napier, Amalie Marie, M.D.**, St. Louis, graduate of Barnes Medical College, St. Louis, 1908; honor member of the St. Louis Medical Society; aged 73; died April 5.

**Thompson, Preston, M.D.**, Lebanon, graduate of Washington University School of Medicine, St. Louis, 1913; member of the Laclede County Medical Society; aged 51; died April 14.

**Cheatham, Riley F., M.D.**, Diamond, graduate of St. Louis College of Physicians and Surgeons, 1903; member of the Newton County Medical Society; aged 71; died April 15.

## COUNCILOR DISTRICT AND SOCIETY PROCEEDINGS

### COUNTY SOCIETY HONOR ROLL FOR 1940

(UNDER THIS HEAD WE LIST SOCIETIES WHICH HAVE  
PAID DUES FOR ALL THEIR MEMBERS)

#### HONOR ROLL

Chariton County Medical Society, December 5, 1939.

Perry County Medical Society, December 11, 1939.

Camden County Medical Society, December 18, 1939.

Miller County Medical Society, December 20, 1939.

Ste. Genevieve County Medical Society, December 22, 1939.

Clinton County Medical Society, December 23, 1939.

Moniteau County Medical Society, January 8, 1940.

Macon County Medical Society, January 10, 1940.

Dent County Medical Society, January 29, 1940.

Dallas-Hickory-Polk County Medical Society, February 15, 1940.

Barry County Medical Society, February 22, 1940.

Audrain County Medical Society, March 22, 1940.

Webster County Medical Society, March 25, 1940.

Morgan County Medical Society, April 8, 1940.

DeKalb County Medical Society, April 15, 1940.

Newton County Medical Society, April 15, 1940.

ASSOCIATE EDITORS: COUNCILORS OF THE  
TEN COUNCILOR DISTRICTS

#### FOURTH COUNCILOR DISTRICT

C. E. FALLET, DE SOTO, COUNCILOR

##### Jefferson County Medical Society

The Jefferson County Medical Society met at Herculanum, April 29, Dr. O. E. Hensley, Herculanum, presiding.

Dr. O. E. Hensley, Herculanum, was reelected president, and Dr. C. E. Fallett, DeSoto, was reelected secretary.

It was decided that meetings be held in June, September and December.

Much correspondence was read among which was a letter from the State Association requesting members to ask for samples and literature from firms advertising

in THE JOURNAL in order that the advertisers may know that their advertisements had been read.

The F. S. A. plan submitted by Mr. Wormsley was discussed. The secretary was asked to provide each member with a copy for study.

Several letters were read from secretaries in adjacent counties regarding vaccination procedure and charges. No two were following the same plan. Discussion followed the reading of the correspondence but no action was taken. The secretary expressed the opinion that public immunizations should be limited to those whose parents sign a written statement that they are unable to pay for such services and that these patients be treated gratis by the members or the county health officer.

A letter from the Association was read advising that barbers' health examination may be made by any licensed physician instead of designated examiners.

Drs. W. E. Gibson, Jr., DeSoto, and E. J. Senn, Herculanum, requested that their names be submitted as desiring to do W. P. A. accident work.

Several case reports were presented.

C. E. FALLET, M.D., Secretary.

#### FIFTH COUNCILOR DISTRICT

W. A. BLOOM, FAYETTE, COUNCILOR

##### Howard County Medical Society

The Howard County Medical Society met at the Lee Hospital, Fayette, April 10.

Dr. W. B. Kitchen, Glasgow, was elected delegate to the Annual Session in Joplin.

The secretary was instructed to write Dr. R. H. Ruff of Central College expressing the Society's appreciation for the dinner and courtesies shown the visiting physicians at the recent Fifth Councilor District meeting.

The transfer of Dr. D. Lee Coffman to the Lawrence-Stone County Medical Society was approved.

W. J. SHAW, M.D., Secretary.

#### EIGHTH COUNCILOR DISTRICT

H. L. KERR, CRANE, COUNCILOR

##### Dallas-Hickory-Polk County Medical Society

The Dallas-Hickory-Polk County Medical Society met at the office of Dr. A. S. Johnston, Wheatland, May 7, with the following present: Drs. A. S. Johnston, Wheatland; G. C. Smith and J. F. Roberts, Bolivar; C. H. Brown, Fairplay; W. H. Greenwood, R. E. Harrell and G. C. Plummer, Buffalo; R. C. Nevins and A. J. Stufflebam, Humansville; T. D. Wrinkle, Halfway; M. L. Gentry, Osceola; Lee Hurt and H. G. Savage, Warsaw; J. L. Johnston and L. F. Heimbarger, Springfield. Mr. Howard H. Stallings, Hickory County; Mr. R. L. Mefert, Polk County, and Mr. Walter Bute, Dallas County, Farm Security Administrators, attended.

Dr. L. F. Heimbarger, Springfield, spoke on "Some Skin Diseases Common to the General Practitioner." He gave early symptoms, treatment, complications and differential diagnoses in an interesting discussion.

Dr. J. L. Johnston, Springfield, spoke on "Home Management of Deliveries" in an able discussion.

The county administrators discussed the health plan that went into effect May 1. Approximately one hundred clients in the three counties have completed their loans and are eligible to receive the benefits of the health insurance. It was voted to amend the resolution formerly passed by the Society to include any regular licensed physician as eligible to participate in the health plan provided he was approved by the Society.

The application for membership of Dr. C. O. Gammon, Buffalo, was referred to the board of censors for report at the meeting at Bolivar on June 4.

Dinner was served at the Christian Church by the



Ladies' Aid to twenty-four physicians and their wives. Music was furnished by the music department of the high school.

R. E. HARRELL, M.D., Secretary.

## NINTH COUNCILOR DISTRICT

ELDON C. BOHRER, WEST PLAINS, COUNCILOR

### South Central Counties Medical Society

The South Central Counties Medical Society met at the El Patio Hotel, Cabool, April 11, at 6:00 p. m. for a dinner meeting.

After a brief business meeting, Mr. George A. Tumbleson, Rolla, of the Farm Security Administration, presented a group health plan for the consideration of the Society. A round table discussion of the plan followed.

The president was instructed to appoint a member in each county to serve as auxiliary members to the Committee on Public Policy.

Members and guests present were Drs. Garrett S. Hogg and J. T. Robertson, Cabool; H. B. Hull, Mammoth Springs, Arkansas; J. A. Fuson, Mansfield; L. T. Van Noy, Norwood; E. C. Bohrer, West Plains; R. H. Ray and C. F. Callihan, Willow Springs, and Mr. George A. Tumbleson, Rolla.

C. F. CALLIHAN, M.D., Secretary.

## TENTH COUNCILOR DISTRICT

E. J. NIENSTEDT, SIKESTON, COUNCILOR

### Cape Girardeau County Medical Society

The Cape Girardeau County Medical Society met at the Colonial Tavern, Cape Girardeau, April 8, for a dinner meeting.

The following members and guests were present: Drs. M. L. Klinefelter, St. Louis; L. J. May, W. J. Benner and H. P. Phillips, Anna, Illinois; A. E. Lee, Illmo; Edward Crites, Sedgewickville; J. J. Bredall, Perryville; A. M. Estes, E. R. Schoen and D. I. L. Seabaugh, Jackson; U. P. Haw, Benton; Frank W. Hall, Charles T. Herbert, G. I. Tygett, D. H. Hope, W. F. Oehler, M. H. Shelby, D. B. Elrod, P. B. Nussbaum, W. H. Wescoat and C. A. W. Zimmermann, Cape Girardeau.

The following letter from Dr. George W. Vinyard, Jackson, acknowledging congratulations on his ninetyeth birthday was read:

Opossum Trot in Sleepy Hollow,  
The Valley Home Stock Farm,  
Old Pill Garlic, Proprietor.

C. A. W. Zimmermann, M.D.,

*My dear Friend:*

This is to thank you sincerely for your kind congratulations upon the occasion of the ninetyeth anniversary of my birth.

I am happy to say that I am now on the last lap of the century, though I am hardly expecting to go much farther. However, I am thankful for the blessings received and those to come (if any).

I also wish to extend, through your courtesy, to the Cape County Medical Society, my sincere thanks and hearty appreciation of their congratulations upon the occasion of my ninetyeth birthday. May God bless them each and every one. Decrepitude and the infirmities of age bar me from the enjoyment of their congenial society. However, my heart is with them. My spirit is willing but the flesh is weak. They have my sincere hope for preeminent success, happiness and prosperity, in the practice of the Divine Art of medicine and surgery.

The Nonagenarian has ceased his roaming.

And now resting quietly in the gloaming.

Listening to his arteries harden

Oblivious to calls from his Dolly Varden.

I extend herewith most kind regards for the Cape County Medical Society, and for yourself, their worthy secretary. Wishing you all well, I am

Respectfully

(Signed) G. W. VINYARD.

The secretary was instructed to buy a lantern slide screen.

Dr. M. L. Klinefelter, St. Louis, gave an instructive and practical address on "Fractures" which was followed by a lengthy discussion.

## Meeting of April 26

The Cape Girardeau County Medical Society met at the Colonial Tavern in special session at 8:00 p. m., April 26.

Members present were Drs. Charles T. Herbert, J. H. Cochran, G. I. Tygett, D. B. Elrod, W. F. Oehler, Frank W. Hall, M. H. Shelby and C. A. W. Zimmermann, Cape Girardeau.

The request of the P. T. A. of the Washington school to examine school children was discussed. Three members had been approached. The result of a brief discussion was the conclusion that the resolution adopted in 1932 answered the question.

The Missouri Prepayment Group Medical Service Plan was discussed. It was decided that "In as much as the plan is inapplicable to the great number of the population, our Society shall go on record as being opposed to this plan and instruct our delegate to that effect."

It was decided that the expenses of the delegate to the Annual Session should be paid by the Society.

C. A. W. ZIMMERMANN, M.D., Secretary.

## St. Francois-Iron-Madison-Washington-Reynolds County Medical Society

The St. Francois-Iron-Madison-Washington-Reynolds County Medical Society met April 26 at 7:30 p. m. at the St. Francois County Courthouse, Farmington.

Dr. V. V. Wood, St. Louis, discussed "Ear, Nose and Throat Conditions That the General Practitioner Is Interested In." He gave a practical talk that was followed by a lively discussion.

Dr. Paul L. Jones, Flat River, stated that he had sent flowers and condolences to the family of Dr. A. A. Meador who recently died at Flat River.

A letter was read from the National Physicians' Committee concerning possible financial support. It was decided to send \$25 from the Society fund to aid in their necessary work in counteracting the adverse propaganda that might harm the present efficient system.

Dr. A. F. Bugg requested that his back dues be remitted and he be accepted as an active member by paying his 1940 dues.

The following members were present: Drs. C. H. Appleberry and Paul L. Jones, Flat River; Reuben Appleberry, C. C. Ault, G. Tivis Graves, N. W. Hawkins, Emmett F. Hoctor, Ralph Kuhlman and Paul J. Schrader, Farmington; Harry W. Barron and Shelby C. Slaughter, Fredericktown; Frank W. Gale, Bismarck; Marvin T. Haw, Jr., David E. Smith and Van W. Taylor, Bonne Terre; J. W. Hunt, Leadwood; Joseph L. Thurman, Potosi, and John P. Yeargain, Irondale.

G. TIVIS GRAVES, M.D., Secretary.

## WOMAN'S AUXILIARY

### WOMAN'S AUXILIARY TO THE AMERICAN MEDICAL ASSOCIATION

18th Annual Meeting, New York

President, Mrs. Rollo K. Packard, Chicago.

### WOMAN'S AUXILIARY TO THE MISSOURI STATE MEDICAL ASSOCIATION

17th Annual Meeting, St. Louis

President, Mrs. Stanley P. Howard, Jefferson City.  
President-Elect, Mrs. J. J. Drace, Chillicothe.  
Adviser, Dr. Herbert L. Mantz, Kansas City.

## President's Annual Report

I have written numerous letters. I have written four messages to the Quarterly *Bulletin* and have contributed

material to the Auxiliary page of *THE JOURNAL*. I have prepared reports for the Missouri State Board meeting and a brief one for Mrs. Neal to take to the Southern Medical Association Auxiliary. I have sent three form letters to county presidents besides the two sent to all members of the executive board. I have distributed twenty-three copies of the minutes of the National Board meeting held in St. Louis in May, to members of the executive board. At the request of the national historian, I have typed the history of Missouri as given in our third year book and with the assistance of Mrs. Werner and Mrs. Mantz brought the history up to date. This copy has been mailed to the national historian.

We are proud of our *Hygeia* record this year. A great deal of credit is due Mrs. Werner, chairman of Buchanan County, for winning the first prize in group four of the contest. Cape Girardeau, Jackson and Lafayette counties were given honorable mention in the contest. We had 155 more subscriptions this year than last.

Excellent work has been done in Public Relations. Nearly all Auxiliaries reported one or more public relations meeting.

Our greatest difficulty seems to be the feeling of a lack of need for an Auxiliary and the members being so busy with other things that they have no time for the Auxiliary.

The promotion of *Hygeia* could be greatly improved. Excellent work was done in some localities while in others little interest is manifested in securing subscriptions.

Public relations promote at all times the first object of the Auxiliary. It should and does bring about a better understanding between the profession of medicine and the public. The auxiliaries are awakening to the importance of health education through their public relations program.

I strongly urge the emphasis on the social side of the Auxiliary. The Auxiliary is no different in this respect from other organizations. The programs must be interesting and the associations pleasant in order to attract members and to keep them.

There should be more and better publicity for the American Medical Association broadcasts.

The gift of \$50.00 from the Missouri State Medical Association again bespeaks their endorsement of our efforts as an auxiliary.

If anything of worth has come from this year, the credit is not mine but belongs to all my coworkers, from the official family to the newest member in the county auxiliary. To each and every one I extend my heart felt thanks.

MRS. PAUL F. COLE, Springfield

## BOOKS FOR LEISURE MOMENTS

### ETERNAL ADOLESCENCE

Emerson's books ordinarily are distinguished by discerning treatment of an acute social condition and the presentation of a probable remedy. The present volume is a disappointment. "The Love Problems of Adolescence" (Emersons Books, Inc., New York) by Oliver M. Butterfield is a juvenile approach to a pressing problem which might have been prepared by a high school senior who submitted a questionnaire to his classmates.

The author addressed 1457 young people in twenty-nine groups, most of them under the auspices of a single church. At the conclusion of his address, he invited his audience to submit questions dealing with intimate problems which could not be discussed in the home. That they were interested, treated the subject with dignified respect, were not embarrassed will be readily admitted by anyone conversant with adolescent psychology.

I doubt that any student can be even mildly aroused by reading that whereas only 6 per cent of a group of Y. M. C. A. and Y. W. C. A. young people wanted to know when petting was right, 89 per cent of a group of suburban church girls wanted the answer to the same question. A little later he will learn that 7 per cent of the first group and 40 per cent of the second wanted to know how engaged couples might avoid overindulgence in petting. In addition to the statistical summary indicating the widespread concern on the part of young people in the development of a mutually satisfactory relationship with the opposite sex the author gives a few abbreviated case histories and a few quotations from real and supposed authorities.

He fails to inform the reader, except by inference, as to his own position on the subject. More important he offers no information which might enable another person to present this topic before an audience of his own. That, I feel, should have been the task of the present volume.  
B. Y. G.

### CORPOREAL SPECULATION

A speculative study in modern biology which begins by destroying certain major and widely held concepts of the human being and ends by destroying what has been so laboriously built up can add only more uncertainty to the role of man. But perhaps that is exactly what David Forsyth, the author of "How Life Began" (Wm. Heinemann, London) had in mind. Dr. Forsyth admits that he lacks formal training in the special field into which natural inclination has led him. Even so, he advances the arguments of those who see in heredity and environment the operative forces which determine the nature of man.

He begins with the assertion that what is often called environment is really heredity. The child is reared in a home molded according to the mores of his parents. But his parents were themselves permitted to grow in an environment patterned by their parents. Each succeeding generation was exposed to the particular environment created by his ancestors. Hence, Forsyth argues, environment is really heredity operating in an extrasomatic fashion. Call it heredity environment and he will agree with you.

The author believes that he has forestalled objections to his mechanistic thesis and meticulously delineates the means of fitting all known facts into his cosmic entelechy. Forsyth, like some other recent writers, overlooks the individual factor of "will" entirely.

Forsyth's book does not answer the question but it will provide no end of discussion which will stimulate the participants to a better understanding of themselves and those who dare to disagree.  
B. Y. G.

## BOOK REVIEWS

LABORATORY MANUAL OF THE MASSACHUSETTS GENERAL HOSPITAL. By Francis T. Hunter, M.D. Third edition, thoroughly revised. Philadelphia: Lea & Febiger. 1939. Price \$1.75.

This is the third edition of a manual which was first prepared in 1922 by a group of medical interns at the Massachusetts General Hospital. It was intended for use as an outline for routine work in the hospital laboratory.

Dr. Hunter has revised and enlarged the book in the new edition which now includes five chapters on diagnostic and therapeutic technics and procedures. In addition, there is a group of convenient tables which present normal values for contents of body fluids, blood chemistry and data concerning the more common pathogenic bacteria.



The small book contains a large amount of valuable information which is presented in a concise and easily understandable manner. It is recognized by the author that all of the important and useful tests cannot be described in such a small volume. He has therefore carefully selected the procedures which have come to be the most common usage in the Massachusetts General Hospital Laboratories.

Many new drugs are constantly being introduced into therapeutics. Of these none has recently been so widely accepted as sulfanilamide and related compounds. The manual has surprisingly little data concerning these drugs. Since careful control of blood levels of the drugs is desirable it would seem that more information about them would have been warranted.

The book is neatly bound and is a convenient size to carry in an intern's pocket. The cover is flexible and is made of a material which should withstand the hard usage of the laboratory.

I recommend it for use by the intern, medical student and medical technician.

P. P.

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**TUMORS OF THE SKIN.** By Joseph Jordan Eller, M.D., Attending Dermatologist, City Hospital, New York City, Consulting Dermatologist French Hospital, Broad Street Hospital, New York, etc. Illustrated with 403 engravings. Philadelphia: Lea & Febiger. 1939. Price \$10.00.

Eller has long been recognized as one who is equipped by interest and experience to write this needed book. As he says, "In order to obtain information on various phases of the subject (of neoplasms of the skin) he frequently found it necessary to consult many sources." The necessity will still exist, but it will be no longer so imperious.

Many excellent features make the treatise one which students, practitioners, dermatologists and libraries will wish to possess. The writing is clear and brief. It does however contain numerous medical clichés such as, "A lipoma may vary in size from a pinhead to a human head."

The illustrations are excellent, and are generously supplied. Illustrations of special value to the practitioner, whose needs have been kept foremost, are those of the chapter on "Cutaneous Surgery and Plastic Repair." Depicted there are Langer's lines of cleavage, suture technic, the closure of square and triangular defects and methods of grafting. Padgett's calibrated dermatone for obtaining grafts of measured thickness is apparently a few months too recent for inclusion in the book, although this invention is of great importance. No photomicrograph shows a whole tumor although the author recommends surgery "in the case of a very small lesion" where the entire tumor may be excised by "biopsy excision." Whole tumor sections have instructional advantages which have been neglected, not alone by Eller.

The strong section of the book is that which deals with the treatment of carcinoma. The author is explicit, graphic and fair to the advocates of surgery and roentgen therapy. The appendix provides exactly the information a radiotherapist uses in planning roentgen, radium or radon treatment. Tables are given showing aluminum and copper filtration for roentgen therapy, effect of skin distance on surface dose distribution, back-scatter, skin reactions and ray quality, cancerocidal doses of low voltage roentgen rays, roentgen ray protection, isodose curves for radium applicators, radon decay and other useful data. In hemangioma he prefers radiation to the sclerosing injections that seem to be gaining in popularity.

The inclusion of xanthoma, warts and condyloma acuminatum illustrates an author's difficulty in drawing the line when his topic is tumors. If one includes

syphilis and tuberculosis, as Eller does, one might as well include leprosy and carbuncle, which he does not. Semasiologically, tumor is pretty hopeless, being as bad as malignancy.

Grading of carcinoma (Broders) is conservatively estimated as being of prognostic use only in marked extremes, an estimation which the reviewer approves but wishes were still more conservative.

Interesting to many specialists will be phlebarteriectasia, nevus elasticus, Unna's fibrokeratoma, Klempner's rhabdomyoblastoma (the photomicrograph of which is indistinguishable from squamous carcinoma), the benignancy of myxoma, the omission of liposarcoma. One wishes the author had commented on Lister's opinion (Lancet 1:1429, 1938) that cavernous angiomas need no treatment.

Startling is the omission of a consideration of experimental carcinogenesis. Benzopyrine, after all, does provoke skin tumors.

Bibliographies are well chosen. Typography, proof-reading and bookmaking are of Lee and Febiger's high standard, yet one wonders whether a book of this size is worth \$10. It is good but it is not magnificent.

R. L. S.

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**OPERATIVE ORTHOPEDICS.** By Willis C. Campbell, M.D., Memphis, Tenn. With 845 illustrations including four color plates. St. Louis: The C. V. Mosby Company. 1939. Price \$12.50.

This is a comprehensive text covering all phases of operative orthopedics. The author is well known for his work in orthopedics and he handles the subject in a masterful manner. In this new edition the author has discussed thoroughly the subjects of dislocations, fractures and affections of the nervous system. Any one of these chapters could be considered a text in itself. His handling of the mechanical side of orthopedics in the chapter on apparatus is an excellent one; it covers all types and varieties of orthopedic appliances, splints and traction. Throughout the book are excellent roentgenograms. This book may be considered a valuable asset in the library of the general practitioner or of the orthopedic surgeon.

T. S. G.

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**PHYSIOLOGY IN HEALTH AND DISEASE.** By Carl J. Wiggers, M.D., Professor of Physiology in the School of Medicine of Western Reserve University, Cleveland, Ohio. Third Edition, Thoroughly Revised. Illustrated with 218 engravings. Philadelphia: Lea & Febiger. 1939. Price \$9.50.

The third revised edition of this textbook of physiology must be regarded as one of the best volumes on physiology recently published. The medical student who is attempting to acquire the general facts of physiology from accurate sources will turn naturally to this volume because of its thoroughness, accuracy and general excellence.

To the medical practitioner, and clinicians in general, this book undoubtedly will make a broad appeal in their efforts to keep up with the rapidly changing facts and theories of physiology. Physiology is the mother of all the medical sciences; and in this volume, is a complete discussion of the research work of physiologists and correct interpretation of these facts as they refer to clinical applications. This is a scientific interpretation of physiology and it has in its discussion many of the perplexing physiological problems which confront the clinician in any field. Each chapter on each subject is complete and if one were to pick out a chapter which was especially valuable, or stood out in any way, one would have difficulty as all subjects are treated completely. In addition to the discussion in the textbook as a whole, there is a bibliography which takes in all the subjects discussed and which will be of great value to anyone

careing to develop or study any subject in a broader way than is discussed in this volume.

Dr. Wiggers, the author of this volume, is well known to physiologists and clinicians as a most reliable student and research worker in physiology. This book is recommended to medical teachers, medical students and to clinicians.

C. H. N.

**A TEXTBOOK OF OBSTETRICS.** With Special Reference to Nursing Care. By Charles B. Reed, M.D., F.A.C.S., Associate Professor of Obstetrics, Northwestern University Medical School, Chicago, etc., and Bess I. Cooley, R.N., Supervisor and Instructor, Department of Obstetrics, Wesley Memorial Hospital, Chicago. With 209 illustrations. St. Louis: The C. V. Mosby Company. 1939. Price \$3.00.

This could have been a valuable book. For the most part, well selected material is concisely presented in an interesting manner well adapted to the teaching of nurses. However, numerous errors which only can be attributed to carelessness impair its usefulness and even make this work dangerous. For example, on page 148 in discussing the subject of simple vaginitis the authors state, "About 5 per cent of these complications end in a form of cancer and therefore the treatment must be immediate curettage upon discovery or, if the woman has passed the menopause, a hysterectomy, if the case does not respond to medication." Read by a nurse without a background of medical knowledge to guide her, such a statement would certainly be taken at its face value. Other similar though less glaring errors occur with regularity throughout the book.

In the opinion of the reviewer the need for a new book on this subject does not justify the apparent haste with which this volume was compiled. It cannot be recommended.

R. G. H.

**THE ELECTROCARDIOGRAM AND X-RAY CONFIGURATION OF THE HEART.** By Arthur M. Master, B.S., M.D., F.A.C.P., Associate in Medicine and Chief, Cardiographic Laboratory, The Mt. Sinai Hospital, New York: Associate in Medicine, The College of Physicians and Surgeons, Columbia University, New York. Illustrated with 71 figures, containing 100 illustrations. Philadelphia: Lea & Febiger. 1939. Price \$6.50.

This book does not deal with the arrhythmias but with the interpretation of the electrocardiogram. The subject matter is presented in atlas form, consisting of teleroentgenograms and electrocardiograms on the same page which gives a visual correlation which can be grasped at a glance.

These illustrations cover the field of cardiology from the newborn to the aged including all the x-ray and electrocardiographic characteristics in health and disease. These include change in body position, respiration, body habitus, pulmonary disease and chest deformities.

The aim of the author to correlate and simplify the relationship of teleroentgenograms and electrocardiograms has been accomplished and is worth while to both the practitioner and the cardiologist. It is an ideal reference book.

J. A. B.

**MANUAL OF DERMATOLOGY.** By Carroll S. Wright, B.S., M.D., Professor of Dermatology and Syphilology, Temple University School of Medicine; Associate Professor of Dermatology and Syphilology, Graduate School of Medicine, University of Pennsylvania, etc. Philadelphia: The Blakiston Company. Price \$4.00.

This handbook is designed for the general practitioner and not the dermatologist. It has the essential facts of diagnosis and therapy with emphasis on the dermatoses which make up the bulk of skin diseases seen in general

practice. In most instances, only the definition is given of the less common conditions. Discussions of therapy are not controversial, the author presenting a few methods which he deems most likely to succeed in the particular condition. The dermatologist would need a more voluminous text but for the general practitioner or as a pocket manual for the dermatologist the book fulfills a real purpose. Presentations follow the method used in the ninth edition of "Diseases of the Skin" by Dr. Jay F. Schamberg and Dr. Wright published in 1934 but there has been complete reclassification, amplification and new photographs.

S. S. B.

**THE VITAMINS.** A symposium arranged under the auspices of the Council on Pharmacy and Chemistry and the Council on Foods of the American Medical Association. Imitation leather. 637 pages. Chicago: American Medical Association. 1939. Price \$1.50.

So much information has become available about the vitamins, that it is difficult even for experts to keep up with the literature. The present volume is a welcome compendium of authoritative information about these accessory food factors. There are discussions of the chemistry, physiology, pathology, pharmacology and therapeutics, methods of assay, food sources and human requirements of each of the important vitamins. The volume is composed of thirty-one chapters written by experts and is published under the auspices of the Council on Pharmacy and Chemistry and the Council on Foods of the American Medical Association.

This book should prove to be an indispensable volume for the library of every physician.

**DISEASES OF THE GALLBLADDER AND BILE DUCTS.** By Waltman Walters, B.S., M.D., M.S., in Surgery, Sc.D., F.A.C.S., Head of Section in Division of Surgery, The Mayo Clinic; Professor of Surgery, The Mayo Foundation (University of Minnesota), and Albert M. Snell, B.S., M.D., M.S. in Medicine, F.A.C.P., Head of Section in Division of Medicine, The Mayo Clinic; Professor of Medicine, The Mayo Foundation (University of Minnesota). With 342 illustrations on 195 figures. Philadelphia and London: W. B. Saunders Company. 1940. Price \$10.00.

This book is one of a series from the Mayo Clinic, dealing with diseases divided anatomically. It is of the same high quality as its predecessors.

It incorporates the inherent, unavoidable defects of all encyclopedic texts, i. e., repetitions and conflicting theories. The incidence of gallstones is given three or four times in the first two hundred pages. There are other examples of the same defect. One is left wondering whose theory is correct, although an attempt is made to right this latter confusion by summarizing the author's interpretations, which may be wrong.

Medical and surgical management are thoroughly discussed including diagnosis, preoperative and post-operative care and surgical technic. The latest advances in controlling the hemorrhagic tendency of jaundiced patients are discussed authoritatively.

The book is an excellent presentation of a tremendous medical and surgical subject. The constructive criticisms voiced occur most frequently in the earlier chapters, those most infrequently invaded by the casual reader.

V. T. W.

**TREATMENT IN GENERAL PRACTICE.** The Management of Some Major Medical Disorders. Volumes I and II. Boston: Little, Brown and Company. 1939. Price \$7.50.

The British viewpoint is well expressed and should be compared with the American viewpoint. The authors are outstanding.

W. G. B.



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### A SINGLE TRAUMA AS AN ETIOLOGICAL FACTOR IN CARCINOMA

W. E. LEIGHTON, M.D.

AND

E. C. SCHMIDTKE, M.D.

ST. LOUIS

The relation of a single trauma to the onset of malignancy has assumed a great importance in recent years, not only as an academic question but more especially as a medicolegal one. From a medicolegal standpoint, the question of the relation of a single trauma to malignancy seems to have been fairly well established in most courts and compensation bureaus when the conditions laid down by Segond are applicable to a case in question.

In 1907, at the French Congress of Surgeons, Segond read his classical paper on the subject of trauma in relation to malignancy. He presented six postulates as follow: (1) the authenticity of the trauma; (2) sufficient importance or severity of the trauma; (3) reasonable evidence of the integrity of the part prior to the injury; (4) correspondence of the tumor to the site of the injury; (5) a date of appearance of a tumor not too remote from time of accident to be reasonably associated with it, and (6) a diagnosis established by clinical and roentgen ray evidence supported when possible by microscopic examination.

Until the etiology of carcinoma is definitely established, the injured man will continue to be the favored party and the burden of proof will be on the defendant since for many years the causal relationship of trauma to cancer seems to have been definitely accepted by many courts and compensation bureaus not only in Europe but in America. However, in justice to the insurance carriers who bear this burden, it behooves the profession to study and judge each case on its own merits.

The word "trauma" is derived from the Latin word meaning "wound" or "injury." The reaction to an injurious agent and to the injury produced

by it varies within wide limits depending on the amount and the nature of the injurious agent and the severity and character of the injury. The reaction may be evidenced chemically by metabolic changes such as alteration of secretion and excretion; morphologically by the presence of serum, fibrin and leukocytes and by the proliferation of cells; and physiologically by alteration of functional activity. To the pathologist, trauma is limited to an injury produced mechanically whereas injury is the term applied to the changes produced in tissues and organs by harmful agents. This latter definition is the sense in which I am using the word trauma.

With the medicolegal aspect of single trauma and malignancy we are not here concerned, but solely with the academic side, and here we are exposing ourselves to criticism since the subject seems to have provoked considerable discussion between the pathologist and research worker on one side and the clinician on the other. As an illustration of the opposing views one might mention the contradictory papers of Knox, who sees no reason for such a relationship, and Coley and Higginbotham, who firmly believe that a single trauma may result in cancer. In October, 1934, Knox published a paper in the *American Journal of Surgery* on "Trauma and Malignancy," concluding with the following paragraph: "Finally the writer believes that no vital evidence has been offered since 1929 to change the opinion expressed in a more extensive survey of the subject published at that time, that as yet no causal relationship has been established between a single trauma to healthy tissues and the appearance of a malignant neoplasm." Such a statement is so much at variance with our own clinical experience that we were tempted to review the history of the cancer cases at The Barnard Free Skin and Cancer Hospital as to the incidence of a single trauma as an etiological cause in the cancer. We purposely excluded histories of sarcomata, all internal cancer and breast cancer, and selected only cases of external carcinomata as it was thus possible for the patient to have visualized his body as to whether there was a tumor for-

From the surgical service of Dr. W. E. Leighton, Barnard Free Skin and Cancer Hospital, St. Louis.

mation or any visible defect prior to his injury. These case reports comprise external carcinoma on various parts of the body. Some of the cases were treated by physicians from the time of the injury to the onset of the cancer and only proven carcinomata are included. There were a hundred or more histories of external cancer in which there was a history of a single trauma, but as some were treated without biopsy those are omitted and some seventy case histories of definitely proven carcinoma with antecedent single injury are reported.

Brown and Brown in 1928 reported a case of epithelioma in a boy 15 years of age. Seven months before while the patient was entering a burning building his foot went through a burned board causing a small abrasion over the front of his right tibia half way between the knee and ankle. Every effort was made by his physician to heal this ulcer but it was very indolent. It would practically heal over and then break down again; this procedure was often repeated.

When the patient was referred to us, we skin-grafted but the failure was complete. The breaking down and healing process continued for a period of about five months, at the end of which time it was progressively increasing with no tendency whatever toward healing. A blood Wassermann was negative. Swabs from the surface of the ulcer showed nothing but the usual pus organisms. A biopsy was performed and the section was reported to be that of a squamous epithelioma. The ulcer was about three inches in diameter at the time. An inguinal dissection and cautery excision of the growth was followed in two weeks by a skin graft. Not a single graft survived.

This was reported by the authors to emphasize the fact that carcinoma may occur, even though rarely, in very young people.

This is case 3 in the series reported by Wainwright who considers it a case of traumatic cancer and made the following conclusions: Summary: A boy aged 15, skin carcinoma in an unusual place. Certainly no cancer was present before and became aggravated. Wound never healed after injury. One year later microscopic proof of squamous epithelioma.

Wells and Cannon in 1939 reported a case of traumatic cancer of the lung.

Male, aged 50, had always been in good health until September, 1926, when he was struck by an automobile. Roentgen ray showed fractures of the left third, fourth and fifth ribs in mid-axillary lines. There was distinct evidence of traumatic injury to the lung as shown by hemoptysis and subcutaneous emphysema extending over the entire body. There was no evidence of neoplasia. He recovered and remained in good health until the following August, when pain and cough developed. Roentgen ray at this time revealed evidence of a cancer in the upper lobe of left lung. He grew steadily worse and died August 17, 1928, less than two years after injury.

Postmortem examination revealed the presence of a primary carcinoma of the upper lobe of left lung. There was a thickening and irregularity of the third, fourth and fifth ribs in the mid-axillary line. In the discussion of this report, Coley's comment is interesting: "Of course it is not possible to say that there was not already a carcinoma too small to be detected by the roentgen film, growing in the upper part of the lung that was traumatized at the time of the injury. But in view of

the extreme infrequency of primary carcinoma of the lung arising in the periphery of the upper lobe, to support such an explanation of this particular case requires a stretching of 'the long arm of coincidence to the vanishing point.'"

A most convincing example of acute traumatic carcinoma was reported by Coley in 1933.

A. K., aged 59, watchman, on November 6, 1931, fell down the stairs receiving a severe blow over the upper part of the sternum from a metal clock that he was carrying. About two months later a small purplish spot appeared at the exact site of the injury. This increased in size and grew rapidly. On January 13, 1932, he was seen by Dr. Coley, and an aspiration biopsy revealed carcinoma. The condition at this time was so far advanced it was regarded as hopeless by all who saw him. Roentgen ray therapy had no effect in checking the disease. Pulmonary metastasis developed in a few weeks and patient died February 8, 1932.

Another case of cancer following a single trauma is a recent report of Rixford in November 1935.

E. S., aged 17, on September 22, 1928, while running from a fire, fell on a tree stump striking the right breast. Because of pain, swelling and soreness, on the seventh day following, he consulted a physician who found the breast swollen to the size of a half grapefruit, red, hard and discolored. The skin was abraded and the nipple and areola injured. Temperature was 101 F. The axillary nodes were enlarged. Under treatment, the breast became normal in a few weeks except for a knot the size of a chestnut directly under the nipple. He returned to work November 16, 1928. Eight weeks after the accident, on November 25, 1928, he again consulted a physician because the swelling was growing. February 1, 1929, it was the size of a half lemon. Movement of the tumor caused dimpling of the skin. He consulted with a surgeon who considered it malignant and advised its removal. A mastectomy was done on March 5, 1929. Thinking the mass mastitis, it was thrown away without microscopic examination. Two and one-half years later, on November 25, 1931, the surgeon was again consulted because of a painful lump in the right axilla. In February 1932 the axillary node was excised and examination revealed a metastatic carcinoma. The patient died August 26, 1932. Autopsy revealed a widespread lymphatic metastasis.

Because of the importance of the case, the records were submitted to Dr. Ewing, who reported "There is no escaping from the conclusion that in all probability, if not a certainty, the boy presented a genuine case of traumatic mammary cancer."

The next two cases of post-traumatic carcinoma are from a paper by Collins on "Trauma and the Malignant Testis":

A teamster, aged 39, entered a Duluth hospital with the history of having been hit in the groin two and one-half months preceding admission. He had suffered pain in that region ever since. Swelling of the right testis began about the same time. On admission the right testis measured five inches long and three and one-half inches in diameter. The left testis was absent, having been removed when he was 6 years old (cause not stated). Wassermann was negative. The testis on palpation was not tender. He had been working up to the day before admission when he had quit work on account of pain. At operation the enlarged testis was removed and the pathological report was carcinoma.

A Duluth millwright, aged 65, entered the hospital in 1925 stating that he was well up to a few weeks preced-



ing admission. He fell astride a plank and soon thereafter began to notice swelling in the right testis. This swelling had been progressing rapidly. He had lost weight to the extent of 40 pounds. Roentgen ray of his chest taken because of cough was normal; also roentgen rays of both kidneys and the spine were normal. The right testis was hard, nodular and approximately three times the size of the left. The involved organ was removed and a pathological examination showed a rapidly growing carcinoma. He was discharged from the hospital "unimproved" and definitely failing. Unfortunately no autopsy or other information is available concerning him. Undoubtedly his condition progressed to an early demise.

#### SUMMARY

It is found in this series of fifty-one cases of carcinoma of the testis collected by Collins that 68.6 per cent gave histories of prior trauma. In some of these it may have been a factor. In some of the traumatic cases the trauma may not have been a factor in etiology. Until some experimental or other proof is elicited, the etiology will remain unsolved. Clinical evidence, however, in this and in other series of cases is gravely suggestive that trauma has been the prime causative factor in carefully worked out instances. It should not be blindly denied.

Ewing in a paper on "Teratoma of the Testes and Its Derivatives" (1911) states: "The belief in the genuine importance of trauma in the origin of these tumors is rendered more acceptable in the light of numerous observations in experimental morphology which show that parthenogenetic (reproduction without sexual union) development of frogs eggs may readily be incited by trauma."

Marques cites two personal observations of cutaneous epitheliomas post-traumatic and reviews twenty-four other cases. In the opening sentence he writes: "The problem of the relationship between trauma and cancer has actually passed from the domain of hypothesis into reality."

In discussing cases 15 and 26, he concludes that "The symptomatology which in our case forms a continuous course from the moment of trauma to the exact diagnosis is sufficient to indicate the traumatic factor."

In this group of twenty-six cases, eight were under 30 years of age, and three were 10, 12 and 17 years of age. Twenty-two were diagnosed as prickle cell epithelioma.

The author was unable to arrange a second group of twenty-seven cases in the table because of the omission of certain facts but considers them traumatic cancers. The cancers followed burns from acids, tar and oil as well as traumatism from automobile accidents, thorns and shell fragments. All were confirmed by microscopic examination and eight were of the prickle cell variety. Seven were under 22 years of age and two were 15 and 17 respectively. The youth of some of these cases is striking when compared to only five cases of spontaneous cancer under 20 years of age recorded by Hall and Bagby in reviewing some 70,000 case his-

tories from The Barnard Free Skin and Cancer Hospital.

Gomez reports the case of a carcinoma of the lung in a laborer who, previously well, had been injured on May 26, 1933, by being thrown against a door of a bus suffering a fracture of the outer one third of the right clavicle, and an injury to the chondrosternal ends of the third and fourth ribs with a corticopleural involvement of the right thorax as shown by the roentgen ray. He recovered, and was discharged from the hospital on July 20, 1933. He returned to the hospital on May 11, 1934. Roentgen ray examination showed an involvement of the right chest wall and the lower lobe of the right lung which had increased rapidly in size causing so much pain that an opiate was required.

On June 1, 1934, under a local anesthetic the chest was opened. The condition was found inoperable because of its excessive growth. The patient died on June 20. No autopsy was obtained. Pathological report was epithelial tumor with abscess and necrosis. Duration of evolution, thirteen and one half months. He concludes that the postulates of Segond have been established in this case.

Balinia et al., report two cases of traumatic carcinoma. Man, aged 62, German, with no family or personal history of cancer and no evidence of any lesion on the face, received a razor cut on the right cheek which was followed in thirty days by a carcinoma. A biopsy revealed a prickle cell epidermoid carcinoma.

The second case of Balinia and associates is of a man, aged 65, Argentinean, who received a razor cut on the face which was followed in twenty days by carcinoma. Because of the social standing of the patient, the history is incomplete. A diagnosis of acute post-traumatic cancer was made.

These two cases were carefully studied and their findings were published by the authors as a contribution to the subject of post-traumatic carcinoma.

Teutschlander is of the opinion that no cancer is produced through trauma in a healthy region of the body, but rather the external action is capable of activating a latent pre-existing condition. Lubarsch, Davis and others believe that injuries and blows call attention to hitherto unsuspected tumors, and Roussy, Roger Williams, Rippart, Knox, Little and others believe that definite proof of trauma as a causative agent in carcinoma is still lacking because in a large amount of experimental work it was found impossible to produce a cancer by any form of local trauma. While denying the possibility of a tumor in exciting a cancer, Knox does admit that trauma may cause a metastasis at a distance and cites her own observations as well as the experimental work of Tyzzer. Coley refers to an unusual case of latent metastasis which was reported by Firket of the University of Liege. Four years after a Kraske operation for a rectal carcinoma during which time the woman had been symptom free, she let fall a rather heavy bowl on her foot. A painful contusion resulted which was followed in two months by a hard nonfluctuating tumor which increased rapidly in size and ulcerated. An amputation performed three months after the injury revealed an adenocarcinoma similar in type to the rectal carcinoma.

Table 1. *Review of Cases by Marques*

Author	Age Sex Occupation	Localization Previous Condition of Skin	Nature of the Trauma	Ensuing Lesions and Evolution	Time Elapsing Between Trauma and Biopsy
1. Bang A. 1938, p. 184	45 Male Gasfitter	Nares Not mentioned	Splashed by hot tar	Burn; 2 days later begin- ning of a pimple. Lesion 1 cm. in diameter at end of 16 days	16 days Prickle cell epitheli- oma
2. Milian & Garnier B. 1928, p. 793	28 Male Tar roofer	Left lower eye lid Not mentioned	Splash of hot tar	Burn; 4 weeks later a round lesion 1 cm. in diameter projecting 1 cm.	1 month Prickle cell epitheli- oma
3. Blum, Bralez & de Vander B. 1929, p. 1039	33 Male Gasfitter	Right lower eye lid Not mentioned	Splash of a drop of hot tar	Burn; 1 month later a le- sion size of green pea; 2 months later size of a 1 franc piece	2 months Prickle cell epitheli- oma
4. Gunsett A. 1930, p. 459	56 Male Installer of pipes	Outer side of right thenar eminence Normal	Small bit of flam- ing asphalt	Burn; 3 months later a nodule size of an almond. Removal Recurrence	3 months Prickle cell epitheli- oma
5. Gate B. 1934, p. 1432	60 Male	Left cheek Not mentioned	Burn—a bit of phosphorus from a match	Some days after the burn a small round elevation	Around 1½ months Prickle cell epitheli- oma
6. Forestier D. 1892, p. 1285	42 Male	Malar region Not mentioned	Cut by a barber	Cut; some days later tu- mor size of grain of bar- ley which in 6-7 weeks grew to size of walnut	6-7 weeks Prickle cell epitheli- oma
7. Gougerot J. des Practi- ciens 1919, p. 178	37 Male Soldier	Gums and maxil- lary sinuses Not mentioned	Blow of a bat which fractured the superior maxilla	6 months later there was a warty red ulcerating appearance	7 months Prickle cell epitheli- oma
8. Hicquel & Oberling D. (R. D. S.) 1923, p. 15	45 Male Shoemaker	Dorsum base right thumb Skin absolutely normal	Contusion from a piece of wood	Wound; 15 days later ele- vation size of a pea; 8 weeks later size 3 x 2½ cm.	2 months Prickle cell epitheli- oma
9. Martinotti Giorn. Ital. Mal. Ven. 1922, p. 198	12 Female	Anterior inner side left thigh Skin normal	Contusion	Wound; 1 month later ul- ceration which never healed	1 month (about) Adeno-epithelioma
10. Bang A. 1925, p. 206	59 Male Laborer	Left side of scro- tum Not mentioned	Prick of a nail	Wound which did not cicatize and grew to size of a baby's palm end of 3 months	3 months Prickle cell epitheli- oma
11. Bourguina These de Paris. 1927	43 Male	Root of nose Not mentioned	Traumatism from a key	Small wound which did not cicatrize. 6 months later tumor 7 mm. in di- ameter	6 months Prickle cell epitheli- oma
12. DuBois Rev. Med. Suisse Rom. 1931, p. 65	79 Male	Back of right hand Not mentioned	Blow of a ham- mer	Excoriation Wound healed 4 months later a tumor appeared	6 months Epithelioma Metatypique Mixte
13. Duhot Loygue & Delacourt C. 1932, p. 1406	27 Male	Back of left hand Not mentioned	Pricked by a brass wire	18 days later a bit of brass was removed from a cyst. Many returns	5 months Prickle cell epitheli- oma
14. Gate Michel & Chapuis B. 1933, p. 1065	53 Male	Floor of mouth Not mentioned	Pricked by fish bone	2 months after this there was a painful ulceration	2 months (about) Prickle cell epitheli- oma
15. Woringer & Marques B. 1934, p. 1773	47 Male Cabinet Maker	Nose near inner angle of right eye	Wounded by point of a scissor	Wound bled a little. 1 month later lesion was size of green pea	1 month Prickle cell epitheli- oma
16. Milian & Chapireau B. 1935, p. 242	73 Female	Back of left hand Not mentioned	Cat scratch	Scratch; wound cica- trized. One end of scar became cancerous	1 month Prickle cell epitheli- oma
17. Montpellier and Fabian A. 1928, p. 188	25 Male	Left frontal bone Skin normal	Blow on forehead against a (Pare- brise) parapet	Wound; 4 months later an ulceration ½ cm.	4 months Basal cell epithelioma
18. DuBois Rev. Med. Suisse Rom. 1931, p. 65	10 Male	Forehead Skin normal	Wound from a fall	Wound healed in 8 days without cicatrix. In 5 months there was a small pimple, 6 months later tumor size of almond	6 months Basal cell epithelioma
19. DuBois Rev. Med. Suisse Rom. 1931, p. 65	50 Male	Left cheek Not mentioned	Fall on face	Excoriation which healed in few days; 6 months later small granulations; 2 years later lesion like grain of coffee	3 years Basal cell epithelioma



Table 1. Review of Cases by Marques (Continued)

Author	Age Sex Occupation	Localization Previous Condition of Skin	Nature of the Trauma	Ensuing Lesions and Evolution	Time Elapsing Between Trauma and Biopsy
20. Gougerot Burnier & Eliaschiff Arch. Hosp. St. Louis 1930, p. 516	40 Female Worker India Rubber Fabric	Left cheek Not mentioned	Burned by hot sulphur of carbon	Burn; 2 months later a deeply undermined lesion	1 year Epithelioma Malatypique Mixte
21. Banq E. 1930, p. 65	Male Fisherman	Right nares Not mentioned	Burn from pipe	Burn which bled; 1 month later a small tumor. Removal and return. 13 months later tumor size of an orange; 2 years later death from metastasis	13 months Prickle cell epithelioma
22. Cornil & Lamy A. 1935, p. 38	26 Male Gardener	Lower lip Skin normal	Splinter of hot iron	Burn of 2 mm. 5 months later an ulceration 8 x 10 mm.	11 months Prickle cell epithelioma
23. Barbaglia Studio Sassaresi S 2 Vol. 5 fasc 3 p. 1	17 Male	Upper lip Normal skin	Contusion from piece of wood	Wound which did not cicatrize. Lesion increased superficially and deep	18 months Prickle cell epithelioma
24. Jeaneney Congr. fr. Chir. 1918, p. 910	29 Male	Bridge of nose Not mentioned	Pricked by a thorn	15 days later a lesion size of pea; healed. A little later an ulceration which in 1 year grew to a size of 3 x 2 cm.	1 year Basal cell epithelioma
25. Nicolas Petouraud & Cruveilhier B. 1934, p. 154	78 Male	Lower jaw Not mentioned	Cut by a razor	Cut; 1 year later a lesion 2 x 1 cm. and another the size of 50 franc piece invading mouth	1 year Prickle cell epithelioma
26. Marques B. 1934, p. 814	63 Male Weaver	Tip of nose Skin normal	Fall	Wound which did not cicatrize; 2 months later lesion size of 50 franc piece growing daily and attaining size of 10 franc piece in 13 months	13 months Prickle cell epithelioma with a sudoriparous tendency

A. Bulletin de l'Association française pour l'étude du Cancer.

B. Bulletin de la Société française de Dermatologie.

C. Bulletin de la Société Médicale des Hôpitaux de Paris.

D. Annales de Dermatologie et Syphiligraphie.

E. Acta Pathologica et Microbiologica Scandinavica, Vol. 7, 1930, Supplement 3.

Maud Slye in her experience with 1,301 indisputable neoplastic growths in mice noted fifty-one at the sites of gross traumata. The neoplasms occurred practically at all areas where wounds were possible. Hereditary predisposition was a factor in her opinion, but this factor is denied by most workers in the cancer field when applied to the human race.

There are numerous references in literature to carcinoma developing on the site of a single injury. Bérard at the International Conference on Cancer in Paris, 1910, reported 328 carcinomas of the breast of which 35 (10.5 per cent) followed a single trauma. Coley in a series of 205 cases of carcinoma of the breast found seventy cases in which there was a definite history of local trauma, or 34.1 per cent.

Janet Lane-Claypon, an English authority, analyzed the histories of 508 cases of carcinoma of the breast selected from the leading hospitals in London. In this number, she found a definite history of antecedent local injury in 136 cases, or 26.77 per cent. As a result of this study she was led to believe that there was a definite association between injury and the subsequent development of cancer of the breast.

MacWilliams, in a study of 100 cases of carcinoma of the breast observed at the Presbyterian Hospi-

tal, found a history of antecedent local trauma in 44 per cent, and Handley in 1912 reported a legally established case of traumatic cancer of the breast. Lowenthal in his paper on the traumatic origin of tumors published in 1894 made one of the most exhaustive studies of the subject that has ever been made. It is based on a careful analysis of 800 carefully collected cases reported since 1870. He also furnished references to 360 cases of malignant disease of undoubted traumatic origin reported prior to 1863, cited in Virchow's *Pathological Tumors*. He noted 137 cases of traumatic carcinoma of the female breast.

Behan in his recent volume on cancer devotes ten pages to the relationship of a single trauma to carcinoma of the breast and gives many references.

Lowenstein reported that in the statistics of the German Army and Navy in the years 1899-1907, 241 malignant tumors were observed in subjects under constant medical attention free from mental bias and that thirty-nine or 16.5 per cent of these were attributed to trauma.

Bainbridge mentioned several references to basal cell carcinoma: "In an analysis of 300 cases diagnosed as rodent ulcer, treated in the Radium Department of the Christ Church Hospital, New Zealand, Fenwick obtained a history of injury of six-

teen patients in the area which afterwards became ulcerated. He believes that skin cancer may result in an area in which injury or chronic irritation may affect the nerve supply to the skin. Paul states 'of the causative factors in the production of basal cell epithelioma, trauma plays an important part. He gives seventy-five cases of rodent ulcer which have arisen indubitably from injury and which would confirm his opinion he believes.' Menetrier referring to epitheliomas has estimated that the continuity between trauma and neoplastic development is often too short and rare for chronic inflammation or slow cauterization to make it possible for the factor of chronic irritation to intervene, and from numerous reports he concludes that traumatism can be the cause of malignant neoplasm, that traumatic action can result in the formation of cancer in a comparative short period of time."

Wainwright of Seranton, Pennsylvania, in his paper on single trauma, carcinoma and workmen's compensation, maintains that if one will admit that the relationship has been a true one even in one case, one must consequently admit that it might likewise be a possibility in any other case in which the relationship comes up for serious consideration.

The variety of external influences now known to act as exciting agents of cancer is great and covers almost every class of natural force. Many act rather directly and others more indirectly. Among the causes of cancer according to Ewing are the following: (1) mechanical trauma, especially when repeated; (2) physical agents, roentgen ray, radium and sunlight; (3) chemicals, inorganic and organic, such as arsenic, chloride of zinc, coal tar products, anilin, dibenzanthracene, phenanthrene, Sudan III and other dye stuff; (4) organic cell products, hormones, folliculin, estrin, decomposition derivatives of the bile acid (Cook); (5) bacteria, especially the tubercle bacillus, *B. caviae* of Laeassange, the virus of infectious epitheliosis (Shope); (6) animal parasites, the spiroptera neoplastica (Fibiger), taenia crassicolis (Borrell), distomiasis. All these exciting causes of cancer were recently reviewed by Maisin (Madrid Congress, 1933).

Ewing further states: "... it thus appears that the scope of cancerogenic agents is coextensive and nearly identical with the excitants of inflammations. This fact compels the conclusion that both processes, inflammation and neoplasia, are the expression of universal cell properties and are correlative. Inflammatory agents produce degeneration, necrosis, exudation, growth of new tissue, regeneration and are usually self-limited, but sometimes run into neoplasia. Cancerogenic agents also produce some degeneration, often exudation, but mainly overgrowth of tissue with various grades of anaplasia, and they are usually but not always progressive. The manifestations of inflammation vary greatly but within certain limits. Inflammatory neoplasia passes by insensible gradations into neoplastic."

In presenting the following case histories, we may be accused of accepting the patient's statement of injury which is of doubtful value in the eyes of the research worker; or of being swayed by the dramatic aspect of the case, as Knox puts it; or relating a "series of anecdotes" as Askanazy describes the previous literature which includes the observations of such renowned scientists as Waldeyer and Virchow.

The first five case histories are from my (Leighton) private records and are presented as examples of carcinomas developing shortly after an injury, which would seem to be the causative factor in the onset of the disease.

Case 1. H. C., aged 52, states that two years ago he was injured by hot steel splashing in his face, injuring the eyelid and side of nose. He was treated by the company doctor for seven months without a complete healing resulting. He presents a typical basal cell carcinoma on the eyelid and side of nose. No biopsy was made but a clinical diagnosis of carcinoma was agreed upon by two members of the Barnard staff.

Case 2. L. V., aged 40, injured his left lower eyelid on a belt pole one year ago and the eyelid was scratched. Several weeks after the lid appeared to heal, a lump similar to a sty developed. This improved slightly but never entirely disappeared and has gradually increased in size. He presents a definite basal cell carcinoma which was verified clinically by two members of our staff. No biopsy was made.

Case 3. L. E., aged 40, fell down an elevator shaft October 25, 1933. Among other injuries received there was an excoriating wound of the dorsal surface of the right hand. This was treated by the company doctor and the patient was out of work for about three weeks. He then went back to work. The hand was still sore. Ten days later he noticed something like a boil on the back of the hand. He poulticed it and a piece of steel came out. He then went to his company doctor about Christmas time and the sore was removed with a cautery. Pathological examination revealed a carcinoma.

Case 4. F. A., aged 39, about two months previous to consultation, while at work in the phenol department of a large chemical plant, burned his lower lip with a drop of carbolic acid. This was treated with a neutralizing agent by the company doctor. There was an incomplete healing and a thick scar followed. In spite of treatment the thickened scar did not disappear and a consultation was asked. On examination, a papular tumor with an ulcerating center, 1½ cm. in diameter, was present on the lower lip. A microscopic diagnosis of carcinoma was made at operation.

Case 5. N. B., aged 32, cut his upper lip with a razor. There was no sore or pimple of any kind at that time. The lesion healed and a pimple or wart appeared which grew rather rapidly. On October 24, 1938, a month following the cutting, he entered the hospital for an excision of the growth which was 6 x 8 mm. in diameter with raised edges and an ulcerating center. There is no family history of cancer except a sister who had a skin cancer. He had no other dermatoses. Pathological report was squamous cell carcinoma.

Such cases are suggestive of trauma or injury being the exciting cause in the development of the cancer. The postulates of Segond in most part are fulfilled and the continuity of events from trauma to tumor progressive.

Ewing in his paper on cancer in the *Bulletin* of the New York Academy of Medicine refers to the



bridging symptoms as follows: "The so-called bridging symptoms between the injury and the appearance of the tumor are of interest and occasionally of importance. When the evidence shows that a wound of apparently normal tissue never healed, that pain, swelling and discharge persisted for weeks and until the definite appearance of a malignant process, then one must accept a presumption in favor of the traumatic origin and rely upon other features if the traumatic theory is to be rejected."

The remaining seventy-four cases are brief abstracts of case histories from The Barnard Free Skin and Cancer Hospital. The statements in these histories should have as much value as any other etiological factor since in none of these was there any medicolegal or compensation question.

1. Case 471. Male, aged 64, fell off a street car falling on his lunch can, knocking out one of the front teeth and cutting his lower lip. Healing was never complete, and one year later the lesion is beginning to increase in size. Family history was not recorded. Pathological diagnosis is squamous cell carcinoma.

2. Case 543. Male, aged 51, was cut on his chin by a barber. The lesion did not heal and continued to grow in size and a year later involves the entire chin. Family history was not recorded. Pathological diagnosis is epithelioma.

3. Case 583. Male, aged 56, was struck in the right ear by one of his fellow workmen causing bleeding to occur. The lesion never completely healed and three years later is increasing in size, involving the entire left ear. Family history shows that mother died of cancer. Pathological diagnosis is epithelioma.

4. Case 609. Male, aged 60, was struck on his lower lip and a small lesion resulted. Healing never occurred, and the lesion has constantly increased in size during two months. Family history was not recorded. Pathological diagnosis is epithelioma.

5. Case 765. Male, aged 72, lacerated his prepuce as a boy. About one and one half years ago a red spot appeared on the scar. Family history is negative for cancer. Biopsy is carcinoma.

6. Case 767. Male, aged 50, about four years ago while riding horseback was thrown onto pommel of saddle. The penis caught between the pommel and a sixshooter and was badly mashed but healed in a few weeks. One year later he again was hurt in the same way. Since then he has had a running sore. Penis partially amputated in April 1909. There has been no recurrence.

7. Case 1209. Male, aged 64, was struck over the malar bone with a stick of wood. A lesion formed and refused to heal. He has been treated almost constantly for three years and recently the lesion has increased in size and now involves the entire right malar region and orbit. Family history was not recorded. Pathological diagnosis is carcinoma.

8. Case 1267. Male, aged 62, several years ago cut himself while shaving in front of the right ear. Lesion has remained open and refuses to heal with simple treatment. It has gradually grown larger, and is painful and is discharging freely. Family history is negative for cancer. Pathological diagnosis is epithelioma.

9. Case 1398. Male, aged 67, about five years ago fell and hit his lower lip. The lesion has remained open. It has had some treatment with paste. Now the lesion involves the entire lower lip, and is about 8 by 3 cm. Family history is negative for cancer. Pathological diagnosis is epithelioma.

10. Case 1576. Male, aged 64, seven years ago a chip flew in his left eye and cut the lower lid. The wound

never healed and has gradually increased in size. The lesion now involves the entire lower lid and entire canthus. Family history was not recorded. Pathological diagnosis is epithelioma.

11. Case 1719. Male, aged 87, two years ago cut his cheek with a razor. The lesion has been kept open by shaving and has increased in size until now it is about the size of a dime. Family history is negative for cancer. Pathological diagnosis is nonkeratizing carcinoma.

12. Case 16986. Male, aged 72, one year ago cut his lower lip with a razor. The lesion did not heal. He has used various home remedies but to no avail. The lesion is now about 1 by 1 cm. Family history shows brother died of carcinoma of face. Pathological diagnosis is carcinoma.

13. Case 17371. Male, aged 65, was hit on the lower right eyelid one year ago with limb of tree. A small firm tumor developed at site of injury and has increased in size. The lesion is now about  $\frac{1}{2}$  by  $\frac{1}{2}$  cm. Family history was not recorded. Pathological diagnosis is epithelioma.

14. Case 20959. Male, aged 63, two months ago bruised the bridge of his nose with a piece of wood. The lesion has not healed and has increased in size. Family history was negative for carcinoma. Pathological diagnosis is basal cell carcinoma.

15. Case 23343. Male, aged 40, gave a history of having had the skin of his neck cut by a barber one year ago. The lesion did not heal and grew to the size of a nickel. It was excised. Family history was negative for cancer. Pathological diagnosis is carcinoma.

16. Case 23779. Male, aged 44, gave a history of having his left cheek cut by a barber two years ago. The lesion is now  $1\frac{3}{4}$  by 2 cm. Family history was negative for cancer. Pathological diagnosis is cystic basal cell carcinoma.

17. Case 23789. Male, aged 56, about two years ago was struck on the lower right eyelid with a piece of wood. The lesion never healed. At present the lesion is 1 by  $1\frac{1}{2}$  cm. with rolled borders. Family history was not recorded. Biopsy showed basal cell carcinoma.

18. Case 24674. Female, aged 56, seven months ago bumped her head. A lump appeared which gradually increased in size. The lump was opened by a physician and the incision failed to heal. She was operated on again and the lump removed two months later. She now has extensive carcinoma of the scalp extending through the bone into the dura. Family history was negative for cancer. Clinical diagnosis is carcinoma of scalp. Prognosis is unfavorable, not treated.

19. Case 25058. Male, aged 58, four months ago injured his lower lip. The wound never healed. He has had nine applications of cancer paste. The lesion is growing rapidly, is 3 by 5 cm. and involves both submaxillary and submental glands. Family history was not recorded. He was referred to a private institution for treatment.

20. Case 25172. Male, aged 66, ten months ago struck his left ear on a mowing machine with a resulting lesion which gradually grew. He had paste applied on one occasion but the lesion continued to increase in size. Family history was not recorded. Clinical diagnosis is carcinoma of left ear.

21. Case 25256. Male, aged 38, five months ago cut the right side of his lower lip on the vermilion border with a razor. A caustic was applied by a druggist but the lesion never healed and increased in size. Clinical diagnosis is squamous cell carcinoma of lower lip.

22. Case 25923. Male, aged 65, had verruca on the back of his right ear. This was cut off by barber. The resulting lesion never healed. He was treated by his family physician but the lesion continued to increase in size. The lesion is now 10 by 10 cm. involving the entire ear and underlying structures and attached to head. Family history was not recorded. Pathological diagnosis is squamous cell carcinoma.

23. Case 26189. Male, aged 46, two years ago struck penis on a saddle horn. A growth appeared on the prepuce. A circumcision and an inguinal dissection was performed in February 1922. He now has a recurrence in the inguinal region. No biopsy was made as patient refused operation. Clinical diagnosis is carcinoma.

24. Case 26327. Male, aged 73, injured the dorsum of his left hand fourteen years ago with a corn stalk. The lesion has never healed. About seven or eight months ago it began to grow rapidly. The lesion now involves the dorsum of the left hand, middle and index and thumb fingers. Family history was not recorded. Pathological diagnosis is squamous cell carcinoma.

25. Case 26932. Male, aged 55, cut his chin about two years ago with a razor. The lesion has not healed and has increased in size. Family history was negative for cancer. Pathological diagnosis is squamous cell carcinoma.

26. Case 27082. Male, aged 47, burned the center of his lower lip two and one half months ago with a cigar. The lesion did not heal. Family history was not recorded. Pathological diagnosis is prickle cell carcinoma.

27. Case 27275. Male, aged 73, has had an ulcer on heel of the right foot about the size of a dollar for about one year. He states it began with a puncture wound from a tack in his shoe and has increased in size. It is now about 3½ cm. in diameter. Family history was not recorded. Pathological diagnosis is melanoma.

28. Case 28566. Male, aged 40, about three years ago was struck on the lower lip with a wrench. A blister formed which never healed. About three weeks after injury he noticed there was some induration about the lesion. He had some medical care which consisted of applications of caustics. The lesion is now 2 by 2 cm. He has markedly enlarged submental glands and there are palpable glands in the submaxillary region. Family history was not recorded. Pathological diagnosis is squamous cell carcinoma.

29. Case 28831. Male, aged 62, about one year ago while chopping sprouts was struck in the mouth with a limb. The lower lip was bruised. Some pain and smarting was noticed at the time of the injury. The following day he noticed a dark colored spot about the size of a pea. About three months later the lesion broke down and has increased in size since that time. It is now about 2½ by 3½ cm. and involves half of the lower lip. Family history was not recorded. Pathological diagnosis is prickle cell carcinoma.

30. Case 29173. Male, aged 78, about a year ago cut the right corner of his mouth with a razor. The lesion failed to heal and increased in size. It now involves the entire lower lip except 1 cm. in the left corner. Family history was not recorded. Pathological diagnosis is squamous cell carcinoma.

31. Case 29860. Male, aged 73, had dorsum of left ear clipped off three years ago by a barber. The lesion failed to heal and is now about 1 by 2 cm. Family history is negative for cancer. Pathological diagnosis is prickle cell carcinoma.

32. Case 31281. Male, aged 63, had left lower third molar tooth extracted four months ago. The site of the tooth never healed. A tumor mass developed at site of extracted tooth which gradually increased in size and bled easily. Family history was not recorded. Pathological diagnosis is squamous cell carcinoma.

33. Case 33312. Male, aged 53, struck the dorsum of his left hand on a concrete mixer about four months ago. A small lump appeared which grew progressively. The lesion is now 2 by 2 cm. Family history was negative for cancer. Pathological diagnosis is squamous cell carcinoma.

34. Case 33813. Female, aged 50, six months ago bruised the dorsum of her right hand. A lump appeared immediately. This was incised three months ago by a physician. The incision failed to heal and the tumor

mass increased in size. Family history was not recorded. Pathological diagnosis is prickle cell carcinoma.

35. Case 34354. Male, aged 54, five weeks ago cut his face just anterior to the left ear. The lesion has not healed. It is now 1 cm. in diameter. Family history was negative for cancer. Pathological diagnosis is squamous cell carcinoma.

36. Case 34355. Male, aged 67, one year ago cut his lower lip while shaving. The lesion did not heal. He has applied various ointments. The lesion is now 3 by 4 cm. in diameter with rolled edges. Family history was negative for cancer. Pathological diagnosis is basal cell carcinoma.

37. Case 36040. Male, aged 45, three years ago scratched the left side of his nose with a rusty nail. The lesion never completely healed. It has grown slowly. On the left side of his nose and upper lip there was a cauliflower-like growth 4 by 2 cm. in diameter. Family history was negative for cancer. Pathological diagnosis is basal cell carcinoma.

38. Case 36899. Female, aged 73, about three years ago scratched the left side of her nose with her fingernail. The lesion failed to heal. It is now about 1½ cm. in diameter. Family history was negative for cancer. Pathological diagnosis is prickle cell carcinoma.

39. Case 37644. Male, aged 66, one year ago scratched the dorsum of his left hand. The lesion did not heal and grew rapidly. It is now 5 by 5 cm. Family history was negative for cancer. Pathological diagnosis is prickle cell carcinoma.

40. Case 37739. Female, aged 64, six weeks ago struck the dorsum of her left hand with a hammer. A small lump appeared which increased in size rapidly. This was opened by her family physician. Family history shows father had carcinoma of stomach. Pathological diagnosis is prickle cell carcinoma.

41. Case 37978. Male, aged 44, six months ago bit the inner side of the right lower lip. It was cauterized by a physician. It apparently healed only to return within ten days. It has not healed since that time. Family history was not recorded. Pathological diagnosis is squamous cell carcinoma.

42. Case 38766. Male, aged 44, four years ago some hot lead splashed on his nose and the lesion on the left side of his nose failed to heal. Family history was negative for cancer. Pathological diagnosis is basal cell carcinoma.

43. Case 38797. Male, aged 66, four years ago bruised the dorsum of his right hand. A lesion formed and failed to heal. He had one roentgen ray treatment with cauterization one year ago. He has had radium therapy twice. Family history was negative for cancer. Pathological diagnosis is basal cell carcinoma.

44. Case 38818. Female, aged 68, eight months ago injured the dorsum of her right hand with a needle. About five weeks ago a swelling appeared at the site of the injury. Family history was negative for cancer. Pathological diagnosis is prickle cell carcinoma.

45. Case 38909. Male, aged 79, four months ago traumatized the dorsum of his left hand with a piece of wood. The lesion has increased in size. There is an ulcerated mass about 1½ by 1½ cm. Family history was negative for cancer. Pathological diagnosis is prickle cell carcinoma.

46. Case 40029. Male, aged 53, two months ago was struck on the outer canthus of the right eye with a piece of steel. The lesion did not heal. Family history was negative for cancer. Pathological diagnosis is basal cell carcinoma.

47. Case 40272. Female, aged 55, with lesion which began two years ago as a result of striking her head against a door. The lesion failed to heal. She has had no treatment. Family history was negative for cancer. Pathological diagnosis is basal cell carcinoma.

48. Case 43445. Male, aged 47, three months ago hit the dorsum of his left hand with a sharp piece of metal.



The lesion failed to heal and a verruca-like growth began to appear. It has gradually increased in size. Family history shows father died of carcinoma. Pathological diagnosis is prickle cell carcinoma.

49. Case 44340. Male, aged 75, about two years ago cut the lower lip with a razor. The lesion refused to heal. It has been growing in size since accident. It is now about 1½ cm. in diameter. Family history is negative for cancer. Pathological diagnosis is squamous cell carcinoma.

50. Case 44342. Male, aged 52, eight months ago while smoking burned his lower lip with a cigarette. The lesion has never healed and has gradually increased in size. The lesion is about 2 cm. in diameter. Family history is negative for cancer. Pathological diagnosis is prickle cell carcinoma.

51. Case 44724. Male, aged 57, has a lesion on the left temporal region resulting from a cut while shaving 6 or 7 years ago. The wound has not healed. It has increased in size gradually and slowly. The lesion at present is 4 by 3 cm. with rolled edges. Family history was negative for cancer. Pathological diagnosis is cystic basal cell carcinoma.

52. Case 44761. Male, aged 67, injured the dorsum of his left hand one year ago with a splinter of wood. The lesion did not heal. He sustained a second injury eight months ago. Since that time the lesion has increased in size more rapidly. The lesion is now 2 by 1½ cm. Family history is negative for cancer. Pathological diagnosis is proliferation, precancerous type.

53. Case 44877. Male, aged 45, about five months ago was injured on his lip by a baseball. The lesion never completely healed. It has grown rapidly to present size of about 2 by 1 cm. Family history shows father had carcinoma of stomach. Pathological diagnosis is squamous cell carcinoma.

54. Case 44907. Male, aged 41, about three years ago was cut on the lower lip. The lesion has never completely healed. It grew slowly for the first two years. The past two months the lesion has grown rapidly. It is now about 2 cm. in diameter. Family history is negative for cancer. Pathological diagnosis is prickle cell carcinoma.

55. Case 46203. Male, aged 70, two years ago fell and bruised his left temporal region, a small lesion resulting. This failed to heal. He has had no treatment. The lesion is now about 4 cm. in diameter. Family history is negative for cancer. Pathological diagnosis is basal squamous cell carcinoma.

56. Case 47569. Male, aged 62, about two years ago cut his left cheek with a razor. The wound remained open, increasing in size. The lesion is now about 1 cm. in diameter. Family history is negative for cancer. Pathological diagnosis is basal cell carcinoma.

57. Case 49361. Male, aged 66, two and one half years ago cut his chin while shaving. The lesion never healed. The ulcer is now 2 cm. in diameter. Family history is negative for cancer. Pathological diagnosis is squamous cell carcinoma.

58. Case 51207. Male, aged 49, farmer, entered Barnard Free Skin and Cancer Hospital July 22, 1932, with the following history. While working on the highway in 1929 he was struck with a knotted rope on the glans penis, bruising the glans which became black and ulcerated. This gradually improved under home remedies. Eight months later it became worse and gradually grew worse. In August 1931 he was treated by a physician who trimmed off the skin of the penis. On August 10, 1932, a radical operation was performed. The family and past histories were negative. Pathological diagnosis is squamous cell carcinoma.

59. Case 51604. Male, aged 73, fourteen months ago was injured on the left lower lip by the limb of a tree. The lesion did not heal. It is about 1 by 1½ cm. in diameter. Family history is negative for cancer. Pathological diagnosis is squamous cell carcinoma.

60. Case 52119. Male, aged 76, cut the right side of his lower lip with a razor three years ago. The lesion failed to heal. He has had two applications of paste. The lesion is now 1.5 cm. in diameter. Family history is negative for cancer. Pathological diagnosis is squamous cell carcinoma.

61. Case 52513. Male, aged 40, about one year ago cut his left cheek with a razor. The lesion never healed. Ulcer is 1 cm. in diameter. Family history was not recorded. Pathological diagnosis is hair follicle carcinoma.

62. Case 54999. Male, aged 55, was circumcised fifteen months ago because of redundant prepuce. The wound failed to heal and a tumor began to grow. The lesion now involves the entire glans and shaft of penis. Family history was negative for cancer. Pathological diagnosis is squamous cell carcinoma.

63. Case 55000. Male, aged 32, about one year ago burned his lower lip with carbolic acid. A small vesicle formed at site of the present lesion. After removing the top of the vesicle a raw open lesion remained which covered over with a scab. The lesion has remained about the same size the last four months. Family history was negative for cancer. Pathological diagnosis is early squamous cell carcinoma.

64. Case 55345. Male, about 50, about two years ago was cut on the left side of his neck by a barber. The resulting wound never healed. He has been treated with diathermy. The ulcer has increased in size rather rapidly during the last three months. The lesion is now about 10 by 8 mm. in diameter. Family history was negative for cancer. Pathological diagnosis is basal cell carcinoma.

65. Case 56512. Male, aged 78, laborer, entered Barnard Free Skin and Cancer Hospital January 2, 1934, with a history of having injured his penis while doing some construction work about six months ago (July 1933). He consulted a physician about four weeks later who gave no treatment. In September he entered the hospital for a diagnosis and was discharged without treatment. Examination showed a large ulcerating mass on the dorsum of the shaft of the penis 5 by 2 cm. The edges were hard and indurated. The lymph glands were enlarged and hard in both inguinal regions. A right inguinal hernia was present. Past history was negative. Pathological diagnosis is squamous cell carcinoma 2 with metastasis.

66. Case 61391. Male, aged 52, laborer, admitted to Barnard Free Skin and Cancer Hospital May 3, 1935. There was no past history of acute illness, venereal disease or operations. Some two months ago while working on a farm with two mules, he threw the hitching rope around a post. From the straining of the mules the rope broke and struck him on the penis. He had some pain at the time which gradually subsided during the following two weeks. Then an ulcer and swelling appeared. He went to a physician who made a dorsal slit. The lesion has increased rapidly with no evidence of healing. Examination showed a large cauliflower mass completely destroying the glans penis. The inguinal nodes were palpable on both sides. Family history showed one sister died of cancer of the stomach. There was no other history of malignancy. A diagnosis of carcinoma was made which was the opinion of other members of the staff.

67. Case 64964. Male, aged 59, burned his lower lip by putting a lighted cigarette in mouth two years ago. The lesion failed to heal. He now has an enormous carcinoma of the lip. Family history is negative for cancer. Pathological diagnosis is squamous cell carcinoma 2.

68. Case 65555. Male, aged 81, burned his lower lip with cigar six or seven months ago. The lesion failed to heal. He now has carcinoma with metastasis to the submental node. The patient was operated upon. Family history was negative for cancer. Pathological diagnosis is squamous cell carcinoma of lower lip with metastasis to submental node.

69. Case 66641. Male, aged 66, cut his right cheek with a razor seven months ago. This lesion never healed. He now has a carcinoma 1 by 1½ cm. Excision was performed. Family history is negative for cancer. Pathological diagnosis is basal and squamous cell carcinoma.

70. Case 67579. Male, aged 54, received an injury to dorsum of his hand five weeks ago. It did not heal. He now has a firm mass 1 by 1½ cm. in diameter with some cellulitis about lesion. The lesion was excised. Family history was negative for cancer. Pathological diagnosis is squamous cell carcinoma 2.

71. Case 67705. Male, aged 47, fell from a wagon seven months ago when his team ran away. He struck the left side of his chest wall on a board. He bruised the chest and broke the continuity of the skin in the area. Shortly after his injury a mass appeared, and shortly thereafter he noticed enlarged glands in the left axilla and also in the supraclavicular region. The lesion was excised for diagnostic purposes. Family history was not recorded. Pathological diagnosis is squamous cell carcinoma 4 with metastasis in the axilla. Patient died shortly thereafter of carcinoma.

72. Case 68473. Male, aged 77, was hit on the face by a limb of a tree months ago. The lesion never healed and is growing much larger. The lesion was excised. Family history was negative for cancer. Pathological diagnosis is squamous cell carcinoma 2.

73. Case 68876. Male, aged 68, four months ago scratched the skin on his left ear. It failed to heal. A tumor appeared. The lesion was excised. Family history was negative for cancer. Pathological diagnosis is squamous cell carcinoma 2.

74. Case 71476. Male, aged 51, six months ago was struck on the lobe of his left ear by a flying nail which he was attempting to drive. He received a break in the skin which never healed. The lesion is approximately 1½ by 1½ cm. Excision was performed. Family history showed maternal aunt had cancer of face. Pathological diagnosis is squamous cell carcinoma.

Table 2. Summary of Injuries and Locations

Location of lesion	Number of Cases
Head	3
Lower eyelid	6
Nose	4
Ear	6
Cheek	10
Lower lip	22
Upper lip	1
Jaw	1
Chin	3
Neck	2
Chest	1
Hand	12
Penis	7
Heel	1
	79

Types of injury  
Blows: wood, hammer or fall  
Razor cuts: circumcision  
Burns: hot metal, cigarettes or acids  
Laceration or excoriation  
Crushing injury

Age at time of injury	Number of Cases
30 40	4
40 50	16
50 60	21
60 70	21
70 80	15
80 90	2
	79

Family history of carcinoma in only 5 cases.

In 31 the cancer appeared from 1 to 10 months after injury.

In 42 the cancer appeared in less than three years.

Seven cases (7 per cent) of injury of the penis were followed by cancer, one of these occurring on the shaft of the penis, an unheard of site.

#### CONCLUSIONS

In the third edition of "Neoplastic Diseases," Ewing devotes a chapter to the special etiology of

tumors; he quotes Sebestyen: "Most traumatic sarcomas arise from the bone, usually after single trauma." He discusses the various forms of trauma in the arguments pro and con closing with the paragraph: "There is urgent need of a judicial investigation from the clinical side of the whole subject of the relation of trauma to tumors."

For this reason I have presented these seventy-nine case histories from the records of The Barnard Free Skin and Cancer Hospital of superficial cancers initiated by a single trauma which are not biased by any medical-legal phase. In recent years, Dr. Ewing has assumed a skeptical attitude to the relationship of trauma to malignancy, yet in his paper before the Academy of Medicine in May 1935, he does admit the possibility of a single trauma as a precipitating cause when the bridging symptoms between the injury and the appearance of the cancer are continuous and progressive.

The histological structure of a cancer but not its actual cause is known. The one characteristic of tumors which can be recognized generally is the theory of cell-autonomy or independent growth which is unlimited and uncontrolled. Normal cells are under control. What causes the mass of cells in a tumor formation to run riot? Evidently something starts the cells which cause the tumor to proliferate just as a spermatozoon influences an ovum. One of the most striking factors developed in experimental research is the action of coal tar products in the formation of tumors. Is the tumor the result of the coal tar or some other unknown quantity? Yamagiwa and Ichikawa made from 55 to 360 daily applications before they succeeded in producing 8 tumors. Yet the fact that cancer can be produced by such substances is accepted although the exact mode of action of these highly cancerigenic coal tar products has not been traced but is probably indirect according to Ewing. In all these experiments the positive fact of injury arises: not once but repeatedly. If it varies in such wide degree, why would it not be possible for a single injury to produce the same result? We have under our care a patient in whom a single burn from tar on the nose resulted in cancer. There is an editorial in the 1933 *American Journal of Cancer* on "Synthetic Cancer" which is pertinent to this subject. In discussion of the effect of isoprene, anthracene, dibenzanthracene, benzpyrine, dibenzpyrine, there is a significant paragraph: "It will be interesting also to see if small quantities of these substances can turn a normal cell growing in vitro into a cancer cell. Probably this will not take place for evidence is accumulating to confirm the opinion of Ehrlich and many other workers of 25 to 30 years ago that the production of cancer is due merely to irritation of some sort, and then in due course of time, some cell by a type of somatic mutation gains the power to grow into tissues without being destroyed as is the normal cell when it wanders. As soon as this occurs, a cancer is present."



While no one believes that a trauma in itself produces a cancer, it apparently does set off something, and I believe from our clinical experience that in certain cases it is the inciting cause or instigation of the cancer.

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## BIBLIOGRAPHY

1. Segond, P.: Rev. de chir. Paris **20**:745, 1907.
2. Knox, Lelia Charlton: Arch. Path. **7**, 1929; Am. J. Surg. (October) 1934.
3. Coley and Higginbotham: Ann. Surg. **98**:991, 1933.
4. Brown and Brown: Southwest. Med. **12**:69, 1928.
5. Wells and Cannon: Arch. Path. **9**:869, 1930.
6. Rixford: Ann. Surg. **102**:814, 1935.
7. Collins, A. N.: J. Lancet **56**:139, 1936.
8. Ewing: Surg. Gynec. & Obst. **12**:230, 1911; Canad. M. A. J., p. 125 (August) 1935; Arch. Path. **19**:690, 1935.
9. Marques: Ann. de dermat. et syph. **7**:1004, 1936.
10. Hall and Bagby: J. A. M. A. **110**:703, 1938.
11. Gomez: Rev. Asoc. med. argent. **51**:619, 1937.
12. Balinía, Nottebehm & Bosq: Rev. argent. de Dermat. Sifil. **21**:137, 1937.
13. Teutschlander: Schweiz. Ztschr. f. Unfallmedizin **25**:371, 1931.
14. Lubarsch: Med. Klin. **8**:1651, 1912.
15. Davis, H. H.: Indust. Med. **6**:86, 1937.
16. Roussy: Rev. d'hyg. **53**:899, 1931.
17. Williams, Roger: The Natural History of Cancer, p. 286, 1908.
18. Rippart: Deutsche. Ztschr. f. Chir. **67**:574, 1898.
19. Tyzzer: J. Med. Research **23**:309, 1913.
20. Firket: Quoted by Coley, loco. cit.
21. Slye: Ann. Surg. **93**:40, 1931.
22. Berard: Internat. Conf. on Cancer, Paris, 1910.
23. Lane-Claypon, Janet: Quoted by Coley.
24. McWilliams: Med. News **126**:644, 1901.
25. Handley: The Practitioner, p. 788, 1912.
26. Lowenthal: Arch. f. klin. Chir. **49**:267, 1894.
27. Behan: Cancer p. 74-84. St. Louis: C. V. Mosby Co. 1938.
28. Lowenstein: Bruns' beitr. z. klin. Chir. **64**:715, 1911.
29. Bainbridge: M. Times & Long Island M. J. (May) 1934.
30. Fenwick: Quoted by Bainbridge.
31. Paul: Quoted by Bainbridge.
32. Menetrier: Quoted by Bainbridge.
33. Wainwright: Am. J. Surg. **5**:433, 1928.
34. Askanazy: Quoted by Coley, loco. cit.
35. Yamagawa and Ichikawa: J. Cancer Research **3**:1029, 1918.
36. Woods: Editorial, Am. J. Cancer **18**:137, 1933.

EARLY OPERATION RELIEVES PRESSURE WITHIN  
SKULL IN LEAD POISONING

Early operation (surgical decompression) to diminish the increased pressure within the skull in lead poisoning of brain tissue is recommended as a means not only of preserving life and vision but also of preventing harmful after effects of the poisoning, by W. Tracy Haverfield, M.D., Paul C. Bucy, M.D., and Anna S. Elonen, M.A., Chicago, in *The Journal of the American Medical Association* for June 22.

Two of five children with the disease whose cases are reported by them, died. "One," they state, "might possibly have been saved had a general rather than a local anesthetic been used. The other was far too ill when first seen to have been benefited by any form of therapy. The three who survived," they continue, "have been followed since the operations for three, five and seven years. Two are physically, neurologically (pertaining to the nervous system) and mentally normal. One is physically in perfect health but is mentally somewhat below his twin brother (not identical twin). However, he has surpassed his twin brother in physical development.

The development of the signs of increased intracranial (within the skull) pressure in a young child without definite localizing signs, especially when accompanied by convulsions or meningeal irritation (inflammation of the enveloping membrane of the brain and spinal cord which produces chills, fever, vomiting, delirium, facial paralysis, etc.) or both, should suggest the possibility of lead poisoning of the brain.

THE BLOOD PICTURE IN VINCENT'S  
INFECTIONS

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Changes in the blood occurring in Vincent's infections of the mouth and throat present such a variety of pictures that it is well worth while to again call attention to them. As illustrated in the accompanying table there is no uniformity in either the total leukocyte counts or in the differential counts, and there is no relation between the total leukocyte count, the differential count and the degree of febrile reaction, or in the duration of the illness. These patients are all young adults of about the same age, being university students. All recovered without complications.

The highest total leukocyte count was 40,000 and the highest neutrophil count was 93 per cent. The lowest leukocyte count was 3,450, and the lowest neutrophil count was 12 per cent. There was no relation between the height of the leukocyte count and the neutrophil count. The highest lymphocyte count was 88 per cent. Five of the cases showed a small number of myelocytes. The red counts varied from 2,560,000 to 6,000,000, and the hemoglobin estimations varied from 58 per cent to 115 per cent.

Experience in the Student Health Service has been that not only is the blood picture of no help in making a diagnosis of Vincent's infection of the mouth and throat, but it is confusing in its suggestion of acute leukemia, the aleukemic phase of leukemia, or acute agranulocytosis,<sup>1, 2</sup> all of which are prone to develop necrotic lesions of the mouth and throat. Other blood pictures are suggestive of a severe pyogenic infection.

Krumbhart<sup>3</sup> proposed the term "leukemoid" to designate such pathological conditions in which the hematologic picture of leukemia may be present but there is not the usual course of leukemia, nor do the organs show the histologic structure associated with leukemia. Ward<sup>1</sup> preferred to call these conditions "secondary or symptomatic leukemia."

A complete analysis of the blood picture with the platelet count and the identification of immature types of white cells helps to differentiate true leukemia from the leukemoid picture of Vincent's infection, but on the other hand, the fact that we oftentimes find Vincent's organisms in the necrotic lesions in the throats of leukemic patients adds to the possible confusion in diagnosis.

Baader<sup>2</sup> observed cases of pharyngeal infections with Vincent's organisms that were associated with leukocytosis and extraordinarily high monocyte counts, and called the condition "monocytic angina."

Hopmann,<sup>3</sup> in 1923, called attention to this blood picture and pointed out that a low red count helped

From the Student Health Service of the University of Missouri.

Table 1. Blood Picture in 128 Cases of Vincent's Infections\*

Case No.	Days in Hospital	Highest Temperature	Leukocytes	Neutrophils Per Cent	Lymphocytes Per Cent	Large Mono. Per Cent	Basophils Per Cent	Eosinophils Per Cent	Myelocytes Per Cent
1	7	103	11,940	76	17	7			
2	10	101.6	8,000	68	18	8	1	5	
3	11	100.8	6,200	68	29	3			
4 <sup>1</sup>	5	101.2	8,790	54	39.5		1		
5	6	102.4	8,672	72	23	4		1	
6	4	101.6	27,330	93	6	1			
7	7	103.2	10,976	73	26			1	
8	4	102.2	5,984	82.5	14.5	2		1	
9	3	102	21,216	85.6	12.6	1.6			
10	9	102.6	26,620	88	8	1		1	
			15,070	70.5	24.5	3.5		1.5	
11	4	100.2	13,760	49	44	7			
12	4	99.6	7,360	49	48	2		1	
13	4	100.2	14,200	86	12	1		1	
14	5	100.4	10,592	81.5	17.5	0.5		0.5	
			18,000	84	13	3			
15	5	100.4	18,240	86	13	1			
16	3	101.6	8,032	66	31	2		1	
17	3	102	11,480	63	36			1	
18	7	99.8	5,120	60	35	3		2	
19	5	103	14,208	82	16.5	1.5			
			20,480	90	8	2			
			18,272	85.5	14.5			1	6
20	7	103	20,350	87.6	12.3				
21	7	100	10,560	38	57	4	0.5	0.5	
22	6	102.4	21,184	93	7				
			23,850	87.5	12	0.5			
23	5	101.6	18,140	84	13	2		1	
24 <sup>2</sup>	20	104	35,840	45	49	6			
			30,900	44.5	49	6	0.5		
			25,530	53	42	4			1
			19,920	52.3	44.3	2.6		0.6	
			16,384	52.6	44	1.6		1	2
			12,636	48.3	48.9	1.3		1.3	3
			14,560	44.6	53.3	0.6		1.3	2 in 300 cells
									0.5
			20,350	44	47	6	1		
			17,440	37	60	3			
			16,352	42.5	57	0.5			2 in 200 cells
									1
			14,752	33.3	65.9	0.3		0.3	
			8,770	46	51	2		1	
			12,510	53	43	3		1	
			13,312	53.5	45.5	1			
			11,680	58	39	1.3	1	0.6	
25	4	100.8	7,550	68	28	3.5		0.5	
26	3	100.8	8,640	78.5	18.5	3			
27	5	103.4	13,664	81.5	18.5				
28	6	100.4	12,508	79	10.5			0.5	
29	6	99.2	7,232	70	29			1	
30	5	98.6	11,360	74	20	4		2	
31	6	99.6	8,100	68	30	1	0.5	0.5	
32	4	103.4	4,030	78	20	1		1	
33	6	98.6	9,790	70	23	6		6	
34	4	102	9,950	76	22	2			
35	12	100.4	6,560	69	25	4		2	
36	5	101	12,030	77	19	4			
37	5	98.6	6,750	58	39	1		2	
38	7	102.8	10,880	72	28				
			12,224	56	42	2			
39	3	101.6	13,760	91	8	1			
40	3	99.4	7,500	55	43	0.6		0.3	
41	4	100	10,240	50	48	2			
42	4	100.6	11,550	74	24	1		1	
43	5	102.4	20,220	88	8	2	0.5	1.5	
44	4	99.4	18,550	49	47.6	3.3			
45	8	104.2	17,900	82	14	3	1		
46 <sup>3</sup>	16	104	5,300	78.3	20	1.7			
			3,750	59	40			1	
			4,200	31	66.3 <sup>4</sup>	1.7		1	
			4,640	20.3	79.7				
			7,700	30	70				
			9,420	29.7	70.7			0.3	
			7,512	29.3	70.7				
			12,400	26.7	73.3				
			8,700	18.7	81.3				
			15,900	27.7	70		0.7	0.3	
			18,000	19	80.3	0.7			
			17,500	21	78				
			16,550	18.5	80		0.5		
			16,200	19	81				
			14,450	12	88				
			16,450	16	84				
47	8	102.6	6,780	77	19	3		1	
			6,720	76.7	21.3	2			
48 <sup>5</sup>	4	101.2	13,890	81	15	2		1	
49	3	101	10,150	70	25	3	1	1	
50	4	101	11,620	83	16	1			
51	8	103.6	10,430	15	81	4			
			10,850	17	81	1			1
52 <sup>6</sup>	11	104	3,500	51.5	14	2	0.5		6
			3,450	56	36	2			6
53	3	101.2	14,880	84	13	3			
54	4	98.6	4,480	72	23	1		4	



Table 1. Blood Picture in 128 Cases of Vincent's Infections\* (Continued)

Case No.	Days in Hospital	Highest Temperature	Leukocytes	Neutrophils Per Cent	Lymphocytes Per Cent	Large Mono. Per Cent	Basophils Per Cent	Eosinophils Per Cent	Myelocytes Per Cent
55	4	101.4	8,640	67	27	4	1	1	
			6,050	79	13.5	5	0.5	0.5	1.5
56	4	98.6	9,824	72	20	3	0.5	4.5	
57	6	102	4,800	75	19	6			
			6,430	65	30	4		1	
58	3	101.6	4,190	50	46	4			
59	4	100.2	13,550	79	19	2			
60	3	100.4	17,344	91	7 <sup>2</sup> / <sub>3</sub>	1	1 <sub>3</sub>		
			9,280	73	25	1			
61	8	100	10,240	66	27	6		1	
62	4	100.4	7,040	54	41	4		1	
63	11	102	13,300	84	11	4	0.7	0.3	
64	5	101.6	17,920	85	3	2			
65	5	102	12,400	89	8	3			
66	5	101.8	12,160	83	13	3		1	
67	3	100.2	10,560	76	21	2.5		0.5	
68	3	99.6	10,780	80	18	2			
69	8	104.8	17,630	79	20	1			
			14,800	70	29	1			
70	6	103.4	21,850	81	18	1			
71	5	101.4	11,650	47	49	4			
72	6	101.6	10,780	85	13	0.5		0.5	
73	6	104.8	13,280	77	22	2			
74	5	100	5,820	60	36	4			
75 <sup>7</sup>	7	100.4	12,864	25	72	2			
			8,510	32	54	12		2	
			10,988	32	67	1			
76	4	102.8	11,392	73	26	1			
77	6	103.6	17,184	90	10				
78	3	102.8	8,544	79	18	2		1	
79	3	100.4	16,550	80	18	1		1	
80	4	102	15,100	77	23				
81 <sup>8</sup>	9	101.6	18,950	27	72	1			
			13,500	36	57	4.5	0.5	1	
			16,100	30	57	12		1	
			12,100	30	63	7			
82	11	99.4	13,820	86	11	3			
83	5	100	14,850	88	12				
84	4	100.6	5,630	79	15	5		1	
85	3	99.2	7,968	74	25	1			
86	6	100.2	3,744	27	70	3			
			12,672	19	81				
87	3	99	19,450	13	87				
			16,352	16	75	8		1	
88	6	102.6	16,640	88	9	3			
89	3	100.6	11,072	81	18	1			
90	6	103.2	9,530	79	21				
91	4	101.8	8,030	82	17	1			
92	3	102.4	11,520	78	18	4			
93	6	100	4,640	66	32	1		2	
			4,750	74	26				
94	3	99.8	12,850	71	28	1			
95	5	104	15,040	76	17	7			
96	4	100	8,864	78	17 5	3	1	0.5	
97	5	99.2	6,660	72	28				
98	7	101.4	20,260	88	9	3			
99	17	101	10,560	31	69				
100	2	99.2	9,632	76	23	1			
101	5	101	7,200	46	49	4		1	
102	6	102	20,800	78	20	2			
103	11	101	6,432	70	26	3		1	
			6,560	42	51	6		1	
104	5	104.4	16,900	67	31	2			
105	7	102.6	13,600	84	11	5			
106	5	102.4	13,310	44	51	5			
107	4	102	16,000	85	13	1		1	
108	5	99.6	8,576	76	19	5		1	
109	5	101.4	20,480	86	13	1			
110	4	99	8,190	35	63	1		1	
111	5	102.2	9,040	81	18	1			
112	5	100.6	13,150	75	22	2		1	
113	7	100	8,960	72	24	3.5		0.5	
114	9	101.4	10,240	76.5	20	3.5			
115	6	102.6	19,000	82	17	1			
			12,990	85	15				
			8,510	60	38	2			
116 <sup>9</sup>	7	101.2	13,060	23	74	2			
			11,808	25	74	1			
117	5	101.8	12,930	88	9	1	1	1	
118	6	101	8,576	81	17	2			
119	9	100.8	5,248	57	37	5		1	
120	3	100.6	12,600	92	7	1			
121	10	99.4	8,940	44	53	2		1	
122	10	100.8	16,260	77	19	4			
123	4	101	8,384	59.5	37.5	2.5		0.5	
124	5	102.4	16,224	86.5	12 5	0.5	0.5		
125	4	100.4	10,880	61	37		1	1	
			16,860	75	24	1			
126	4	99	5,280	57	36	2.5	1	3.5	
127 <sup>10</sup>	16	103.6	24,832	16.6	79.6	0.6			
			40,000	18.5	81.5				
			34,016	53	47				
			24,064	47	52	1			
			22,720	52	47	1			

Table 1. Blood Picture in 128 Cases of Vincent's Infections\* (Continued)

Case No.	Days in Hospital	Highest Temperature	Leukocytes	Neutrophils Per Cent	Lymphocytes Per Cent	Large Mono. Per Cent	Basophils Per Cent	Eosinophils Per Cent	Myelocytes Per Cent
			18,912	63	34	3			
			11,870	52	40	7		1	
			14,340	50	45	3	0.5	0.5	
			8,608	28.6	71.3				
			9,980	50	48	1	0.5	0.5	
			11,970	45	51	3	1		
			9,470	57	39	3		1	
128	6	102.4	14,976	78	21	1			

\*Diagnosis was Vincent's angina of mouth in cases 2, 3, 5, 7, 26, 28, 29, 61, 97, 100; of the mouth and tonsils in cases 40, 49, 52, 119, 126; the other cases were of Vincent's angina of the tonsils.

1. Transitional cells, 5.5 per cent.  
2. Erythrocytes and hemoglobin readings: 6,000,000 and 75 per cent; 4,400,000 and 62 per cent; 4,330,000 and 70 per cent. Myeloblasts 1.5 per cent.

3. Erythrocytes, 4,000,000; hemoglobin 75 per cent. Several young lymphocytes were seen. Unclassified 1.3, 1 and 1 per cent. Platelets 450,000.

4. The lymphocytes present are not abnormal except in percentage numbers. No degenerative leukocytes are found. This does not appear as an agranulocytosis the general count to the contrary.

5. Immature polymorphonuclears 1 per cent.

6. Immature polymorphonuclears 26 per cent.

7. Lymphoblasts 1 per cent.

8. Lymphoblasts 1 per cent; erythrocytes 2,560,000; hemoglobin 60 per cent; erythrocytes 3,000,000; hemoglobin 58 per cent.

9. Lymphoblasts 1 per cent.

10. Lymphoblasts 1 per cent. A few immature polymorphonuclears. Erythrocytes and hemoglobin readings: 4,810,000 and 90 per cent; 4,550,000 and 85 per cent; 4,990,000 and 90 per cent; 3,900,000 and 115 per cent; 4,900,000 and 80 per cent; 4,720,000 and 100 per cent; 4,640,000 and 90 per cent; 4,880,000 and 88 per cent; 4,800,000 and 98 per cent.

3. Krumbharr, E. B.: Leukemoid Blood Pictures in Various Clinical Conditions, *Am. J. M. Sc.* **172**:519, 1926; *Tr. A. Am. Physicians* **41**:343, 1926.

4. Ward, G. R.: Secondary or Symptomatic Leukaemia, *Proc. Roy. Soc. Med. (Med. Sect.)* **7**:126, 1913.

5. Hopmann, R.: Akute infektiöse Stammzellenvermehrung im Blute mit Heilung, *Deutsches Arch. f. klin. Med.* **142**: 196, 1923.

## EPIDEMIOLOGY OF PNEUMONIA

DISTRIBUTION OF TYPES OF PNEUMOCOCCI IN SPECIMENS FROM FOUR DIFFERENT GROUPS OF INDIVIDUALS

S. EDWARD SULKIN, Ph.D.

ST. LOUIS

This study was undertaken to determine the distribution of types of pneumococci in the upper respiratory tract of healthy individuals residing in the St. Louis metropolitan area. The need for information concerning the significance of types other than I, II and III became apparent after Cooper and her associates<sup>1, 2</sup> reported that Group IV could be divided into a large number of types (IV to XXXII).

### REVIEW OF LITERATURE

It is known generally that pneumococci exist in the normal nasopharynx without causing any appreciable disturbance. The organisms may be virulent or avirulent and are sometimes the predominant bacterial species. These so-called normal pneumococci rarely cause pneumonia although they may be of full virulence. Park and Williams<sup>3</sup> found pneumococci in specimens from 55 per cent of more than two hundred healthy persons. In a systematic study on more than one hundred individuals, Gundel<sup>1</sup> found that while the type of pneumococcus usually proved to be the same in successive tests on a given individual, occasionally changes in type were found. Organisms of Group IV were present in 60 per cent of the subjects tested

to identify a true leukemia. In our series we did not find this true as some red counts were below 3,000,000, the lowest being 2,560,000.

The leukemoid picture is well illustrated by case 127 in which the leukocyte count reached 40,000 and the lymphocyte count reached 81.5 per cent.

In opposition to the leukemoid picture is the leukopenia often seen in Vincent's infections of the mouth and throat, in which the count may be low, the neutrophils may almost disappear from the blood picture and a syndrome suggestive of agranulocytosis may be observed, as in case 86 in whom the count dropped to 3,744 and the neutrophils dropped to 27 per cent. This picture may be confusing because Vincent's organisms are often found in the necrotic lesions in the mouths and throats of patients suffering from agranulocytosis. Again, an average leukocyte count with increased monocytic cells arouses a suspicion of the aleukemic stage of leukemia, as in case 51, which had a leukocyte count of 10,430 with a lymphocyte count of 81 per cent.

Many of the blood pictures are typical of a massive pyogenic infection of the body as is seen in pneumonia, as in case 6 with 27,330 leukocytes and 93 per cent polymorphonuclear neutrophils.

I am presenting the blood picture of 128 cases in their proper sequence in our record files.

### CONCLUSIONS

Most of the textbooks of medicine make no mention of the results of the blood examination in Vincent's infections.

The blood picture of Vincent's infections of the mouth and throat not only does not aid in the differentiation from other disease conditions but may actually lead to erroneous conclusions when attempting to evaluate the blood picture.

### BIBLIOGRAPHY

1. Forkner, C. E.: Leukemia and Allied Disorders, p. 187, 192, Macmillan, New York, 1938.
2. Baader, E.: Die Monocytenangina, *Deutsches Arch. f. klin. Med.* **140**:227, 1922.

From the Laboratory Section of the St. Louis Health Division, St. Louis.

With the technical assistance of Valentina Hofsoner, B.S.



successively throughout the year, while pneumococci of the first three types were relatively infrequent (type I in 0.8 per cent, type II in 0.4 per cent and type III in 6.7 per cent).

The studies reported by Rosenau, Felton and Atwater,<sup>5</sup> and by Powell, Atwater and Felton<sup>6</sup> threw additional light on the carrier problem. These authors isolated type I pneumococci from four times as many subjects in contact with cases of lobar pneumonia as from normal persons not exposed. Type III organisms were recovered twice as often in contacts as in normal persons but there was no appreciable difference in the incidence of type II pneumococci. Strains belonging to Group IV occurred in 83.5 per cent of contacts and 69.3 per cent of normal individuals.

Christie<sup>7</sup> isolated pneumococci from eleven of twelve nurses in the pneumonia ward of a Glasgow hospital and from none of nurses in control wards. Of the organisms found in the nurses exposed to pneumonia, type I pneumococci were demonstrated four times and type II seven times. The author did not mention whether the organisms found corresponded to the types prevalent among the pneumonia patients. Schleifstein<sup>8</sup> found 73 per cent of one hundred normal individuals, who had not been in contact with pneumonia patients, harboring pneumococci.

MATERIALS AND METHODS

In the present investigation observations were made on nasopharyngeal cultures procured from two groups of normal people. The first group consisted of eighty-four adults connected with the Municipal Visiting Nurses' Section of the St. Louis Health Division. A brief history was obtained from each person with particular reference to pneumonia, colds, tonsillitis, sinusitis and contact with pneumonia patients. The second group consisted of sixty-three doctors, nurses and attendants of the Homer G. Phillips Hospital,\* who were in close contact with pneumonia patients. Swabbings from the upper part of the nasopharynx and both tonsils were cultured in Avery's broth for from four to seven hours at 37 C. Blood cells were removed by centrifugation at slow speed for about five min-

utes. The turbid supernatant fluid was transferred to a 15 cc. centrifuge tube and centrifuged at high speed for about ten minutes and the supernatant fluid then discarded. The sediment was examined by the Neufeld quellung method.<sup>9</sup> Part of the sediment was injected into the peritoneal cavity of a white mouse. Peritoneal fluid, withdrawn by means of a sharp capillary pipet, was examined after from twenty-four to forty-eight hours. Mice which survived were discarded after five days.

Sputum specimens were examined from two additional groups of individuals. The first group consisted of 200 clinical cases of pneumonia.\*\* The second group consisted of individuals with pulmonary involvement other than pneumonia. Specimens were submitted to the laboratory for the routine examination for acid-fast organisms. After thorough washing in salt solution, the sputum was cultured in Avery's broth and the procedure was then the same as with the nasopharyngeal cultures. Frequently, pneumococci were demonstrable by direct quellung on the sputum.

RESULTS

As shown in table 1, 70.2 per cent of the nasopharyngeal cultures from the group of eighty-four Municipal Visiting Nurses were found to contain pneumococci; 58.0 per cent were positive by the direct Neufeld quellung method, while 42.0 per cent were positive by the mouse method. Of the specimens found positive by the Neufeld method, 55.5 per cent were negative in the mouse and 44.5 per cent were positive. Contrary to expectation, only 63.5 per cent of the contacts were found to harbor pneumococci in their throats; 69.8 per cent were positive by the direct Neufeld quellung method, while 30.2 per cent were positive by the mouse method. Of the sputum specimens submitted for the routine examination for acid-fast organisms, 59.7 per cent contained pneumococci; 68 per cent were demonstrable by the quellung method and 32.0 per cent by the mouse method. Figure 1 shows the type distribution in these four groups of individuals. Although type I is the most frequent cause of lobar pneumonia, this type was not found

\*Information concerning this group of patients was obtained from the files of Dr. Emanuel Sigoloff, Director of Pneumonia Control Program sponsored by United States Public Health Service and Missouri State Health Department in collaboration with the City of St. Louis.

Table 1. Incidence of Pneumonia in Specimens From Clinical Cases of Pneumonia, Patients With Pulmonary Involvement Other Than Pneumonia, Contacts and Normal Persons

Source of Material	Number of Specimens	Per cent Positive	Per cent Negative	Positive by Neufeld	Negative	Mouse Positive	Positive by Mouse Only
Clinical cases of pneumonia	200*	100.0		77.0			23.0
Contacts (doctors, nurses and attendants)	63	63.5	36.5	69.8**	63.3	36.7	30.2
Pulmonary involvement other than pneumonia (sputum)	154	59.7	40.3	68.0	64.0	36.0	32.0
Normal persons	84	70.2	29.8	58.0**	55.5	44.5	42.0

\*Only those cases were selected in which positive laboratory findings were obtained.  
\*\*Direct examination of Avery's broth sediment by Neufeld method.

in specimens from normal persons, contacts or from patients with pulmonary involvement other than pneumonia. On the other hand, type III, which is a frequent incitant of pneumonia, was found more frequently than any other type in specimens from normal persons, contacts and patients with pulmonary involvement other than pneumonia. The fact that type III organisms are highly virulent for mice may account for the high incidence. Types I, V, VII, IX, XV, XXIV, XXV, XXVII and XXXII were not encountered in specimens from normal individuals. Of these types contacts were found to harbor V, VII and XV. Types III, VIII and XVIII predominated in the group of contacts.

Table 2 shows the percentage of correlation between exposure to a specific type of pneumococcus

Table 2. The Correlation Between Exposure to a Case of Pneumonia Due to a Specific Type of Pneumococcus and Prevalence of Homologous Type in Nasopharynx of Contacts and Normals

Type of Pneumonia	Total Persons Exposed	Contacts Carrying Similar Types (Per Cent)	Distribution of Similar Types in Normals	
			Number	Per Cent
I	22			
II	28	7.1	1	1.6
III	14	21.4	7	11.2
IV	25	8.0	2	3.2
V	10	10.0		
VI	14	7.1	1	1.6
VII	27	3.7		
VIII	26	11.0	2	3.2
IX	14		2	3.2
XIV	16	6.1	1	1.6
XVIII	16	19.0	3	4.8
XIX	9	11.0	4	6.4
XXV	16			

and prevalence of the homologous type in the nasopharynx of contacts and normal persons. The diagrammatic scheme (fig. 2) used in visualizing the contact data is similar to that used by Rosenau and his collaborators.<sup>5</sup> The lines between case and persons exposed and between two contacts indicate the extent of exposure, three lines representing close association and one line slight. Squares represent individuals exposed while circles indicate

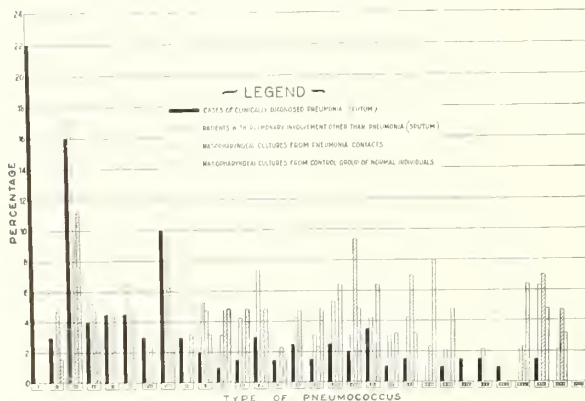


Fig. 1. Distribution of types of pneumococci in specimens from clinical cases of pneumonia, patients with pulmonary involvement other than pneumonia, contacts and normal persons.

patients with pneumonia. The enclosure contains the specimen number of the case or contact and the type pneumococcus found. Of twenty-six contacts exposed to patients with type VIII pneumonia 11.0 per cent were found to harbor the same type pneumococci, while only 2 or 3.2 per cent of the eighty-four normal persons harbored this type pneumococci. Three type VIII pneumonia patients and their contacts are presented graphically in figure 2. Of fourteen doctors, nurses and attendants exposed to case JEN, only one showed type VIII pneumococci in the nasopharyngeal culture. It is interesting to note that in this group a doctor, nurse and attendant were exposed to a patient (case BAY) with type XVIII pneumococcus and all of these individuals harbored the same type in the respiratory tract. In another instance, two out of twelve persons exposed to two type VIII pneumonia patients (cases LEC and McC) showed type VIII in the nasopharyngeal cultures. The roommate of one of these individuals (Nurse 307) also showed type VIII pneumococci. These findings are in agreement with those of other investigators<sup>10, 11, 12, 13</sup> and suggest that in the control of pneumonia, patients, contacts and carriers must be considered as possible reservoirs of infection.

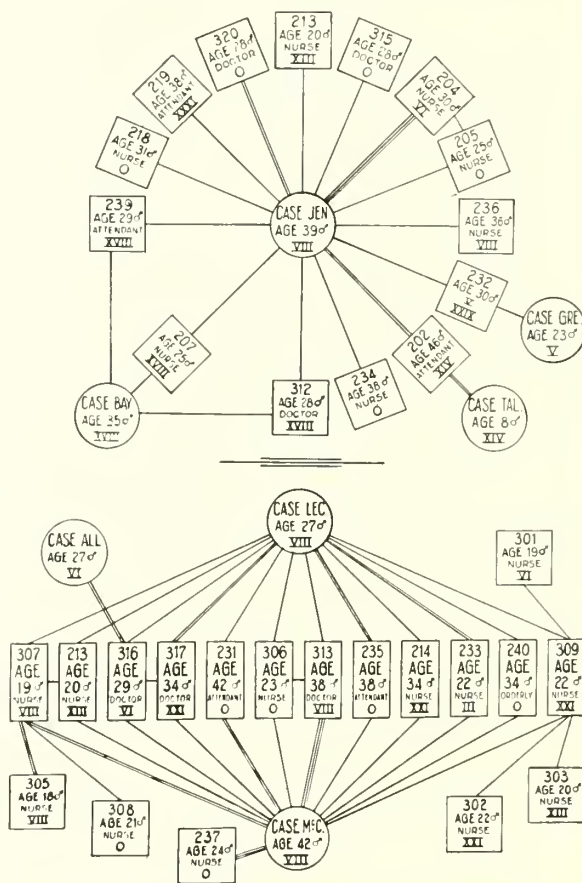


Fig. 2. Graphic presentation showing distribution of types of pneumococci in contacts exposed to clinical cases of pneumonia (type VIII).



The following cases are cited to further emphasize the fact that occasionally members of the family of a pneumonia patient contract the disease.

#### REPORT OF CASES

Case 1. B. N., a girl, aged 3, was admitted to the hospital March 7, 1939, after an illness of five days. A diagnosis of type I pneumonia was made and the child was discharged on March 14. Two days after the child's admission to the hospital the mother, G. N., aged 25, was admitted to the hospital with a diagnosis of type I pneumonia. She was discharged on March 21.

Case 2. R. P., a boy, aged 12, was admitted to the hospital on January 29, 1939, after a seven day illness. A diagnosis of type I pneumonia was made and the child was discharged on February 6. Six days after the onset of illness his sister, H. P., aged 8, became ill and was admitted to the hospital on January 31. A similar diagnosis was made and the child was discharged on February 6.

Case 3. M. B., a white woman, aged 70, was admitted to the hospital on January 3, 1939, after an illness of eight days, and a diagnosis of type VIII pneumonia was made. Twelve days after this patient became ill her husband, C. B., aged 72, became sick and was admitted to the hospital on January 8 with a diagnosis of type VIII pneumonia. Patients were discharged from the hospital on January 14 and 13 respectively.

Case 4. F. M., a white male, aged 24, was admitted to the hospital on January 22, 1939, after an illness of three days. A diagnosis of type I pneumonia was made and he was discharged on January 31. Mrs. M. M., his mother, aged 58, was admitted to the hospital nine days later with a diagnosis of type I pneumococcic meningitis. This patient died on February 19 after an illness of eleven days.

#### DISCUSSION

The discovery of a successful means for preventing the spread of typhoid fever was long delayed because of the prevailing belief that the disease was infectious rather than contagious. Discovery to the contrary resulted in prompt isolation of patients with a noticeable decrease in the spread of the disease. Although pneumonia is not generally regarded as a contagious disease, recent studies together with the present investigation support the belief that pneumonia is a communicable disease. This is especially true of infections caused by types I or II pneumococci. Patients with pneumococcic pneumonia should be subject to isolation precautions so that spread of infections either by droplet or direct contact may be prevented. Since lowered resistance is a predisposing factor to infection special care should be taken to protect patients in the postoperative state and those with debilitating diseases from any direct or indirect contact with pneumonia patients.

Although isolation of cases of pneumonia could not be expected to be more than partially effective in controlling the disease, such a procedure undoubtedly would decrease the number of dangerous carriers in the community and prevent cross-infections and superinfections in the hospital. Pneumococcic pneumonia therefore should be regarded as a communicable disease.

#### CONCLUSIONS

1. Of the group of eighty-four normal individuals who had not been in contact with pneumonia patients, 70 per cent were found to be pneumococcus carriers, while 63.5 per cent of sixty-three contacts were found to harbor pneumococci.

2. Of the sputum specimens submitted for routine examination for acid-fast bacilli, 59.7 per cent contained pneumococci.

3. The following serological types of pneumococci (the most frequent, in order of frequency) were found in the various groups of individuals.

A. Clinical cases: I, III, VIII, V, VI, IV.

B. Patients with pulmonary involvement other than pneumonia (sputum): III, XIII, VI, XXIX, IV, X.

C. Contacts: III, VIII, XVIII, XXI, XXIX.

D. Normal persons: III, XXII, XVII, XIX, XXVIII.

4. Patients with pneumococcic pneumonia should be subject to the same general isolation precautions found successful with other contagious diseases.

5. Pneumococcic pneumonia should be regarded as a communicable disease of distinct public health significance.

Municipal Courts Building.

#### BIBLIOGRAPHY

1. Cooper, G.; Edwards, M., and Rosenstein, C.: The Separation of Types Among the Pneumococci Hitherto Called Group IV and the Development of Therapeutic Antisera for These Types, *J. Exper. Med.* **49**:461, 1929.
2. Cooper, G.; Rosenstein, C.; Walter, A., and Peizer, L.: The Further Separation of Types Among the Pneumococci Hitherto Included in Group IV and the Development of Therapeutic Antisera for These Types, *J. Exper. Med.* **55**:531, 1932.
3. Parks, W. H., and Williams, A. W.: A Study of Pneumococci: A Comparison Between the Pneumococci Found in the Throat Secretions of Healthy Persons Living in Both City and Country and Those Obtained From Pneumonic Exudates and Diseased Mucous Membranes, *J. Exper. Med.* **7**:403, 1905.
4. Gundel, M.: Bakteriologische und epidemiologische Untersuchungen über die Besiedlung der oberen Atmungswege Gesunder mit Pneumokokken, *Ztschr. f. Hyg. u. Infektionskr.* **114**:659, 1933.
5. Rosenau, M. J.; Felton, L. D., and Atwater, R. M.: An Epidemiologic Study of Pneumonia and Its Mode of Spread, *Am. J. Hyg.* **6**:463, 1926.
6. Powell, J. P.; Atwater, R. M., and Felton, L. D.: The Epidemiology of Pneumonia: A Study of Pneumococcus Carriers Among Four Groups of Persons Over a Period of Months, *Am. J. Hyg.* **6**:570, 1926.
7. Christie, I. M.: Type Specific Organisms in Acute Pneumonia and in Convalescents and Contacts, *Lancet* **2**:1173, 1932.
8. Schleifstein, J.: Distribution of Types of Pneumococci in Specimens From Normal Individuals and From Patients Having Pneumonia, *New York State J. Med.* **38**:1, 1938.
9. Neufeld, F., and Etinger-Tulczynska, R.: Nasale Pneumokokken infektionen und Pneumokokken keimträger in Tierversuch, *Ztschr. f. Hyg. u. Infektionskr.* **112**:492, 1931.
10. Benjamin, J. E.; Rueggeger, J. M., Senior, F. A.: Cross Infection in Pneumococcic Pneumonia, *J. A. M. A.* **112**:1127, 1939.
11. Smillie, W. G.: The Epidemiology of Lobar Pneumonia, *J. A. M. A.* **101**:1281, 1933.
12. Smillie, W. G., and Leeder, F. S.: Epidemiology of Lobar Pneumonia, *Am. J. Pub. Health* **24**:129, 1934.
13. Webster, L. H., and Hughes, T. P.: The Epidemiology of Pneumococcus Infection: The Incidence and Spread of Pneumococci in the Nose and Throats of Healthy Persons, *J. Exper. Med.* **53**:535, 1931.

Deafness due to obstructions of the eustachian tubes has been reported as having been relieved by an airplane flight, *The Journal of the American Medical Association* for June 22 says in answer to a question as to how such relief might be obtained.

## MEDICAL ASPECT OF TOXIC GOITER

E. J. NIENSTEDT, M.D.

SIKESTON, MO.

I will attempt to mention a few of the interesting features of the medical aspect of toxic goiter with the hope of encouraging a more thorough study of goiter. I wish to acknowledge and heartily sanction the surgical treatment.

The names, classifications, symptoms and probable causes are numerous. A simple classification is toxic and nontoxic diffuse, and toxic and nontoxic nodular. The exact cause of toxic goiter is unknown. It is agreed that some unknown toxic agent acts in a harmful way on the heart, nervous system and vital functions of the body. A controversy exists as to whether this toxic agent is developed in the thyroid gland or in some other part of the body. If the toxic agent is developed in some other part of the body, the condition we have been calling hyperthyroidism, thyrotoxicosis and toxic goiter probably should be classed as a constitutional disease. There is a theory supported by many that the thyroid gland is one of the organs acted on by a poisonous agent rather than being the generator and distributor of this agent. Differences of opinion are expressed as to the pathological changes in goiter as the patient advances in years.

For convenience of discussion this paper will attempt to consider the etiology, symptomatology and differential diagnosis of goiter under the two headings, Graves' disease and toxic adenoma. This classification is based on the belief that it can be shown that each has distinguishing tendencies and features which characterize them as distinct entities. These diseases appear in people of different nervous temperaments, occur at different ages and develop with different rapidity of toxic symptoms.

Patients with Graves' disease, or exophthalmic goiter, frequently present a personal as well as a family history of inherited tendencies toward nervousness and emotionalism as a predisposing cause. Some have an alert mentality above the average. Some have what appears to be an endocrine imbalance. Laziness, slothfulness and stupidity are seldom or never seen in this class of patients. The exciting cause is presumed to be a psychic trauma, the result of any happening which shocks, worries, frightens or otherwise disappoints the individual. Females are more susceptible than are males. Adolescence, adult life, pregnancy and the menopause seem to play some part. Symptoms frequently develop in a few weeks or a few months following the exciting cause.

The average age of the patient with Graves' disease is usually ten or fifteen years younger than the average age of the toxic adenoma patient although the disease may occur at any age.

The typical picture consists of exophthalmos, en-

larged thyroid, tachycardia, nervousness, tremor, ravenous appetite, loss of weight, intolerance of heat, excessive perspiration especially of the hands, increased basal metabolism rate, dermatographia, and a blood pressure frequently below normal. Enlarged thyroids in some patients aid materially in the diagnosis because of their prominence, throb, thrill and bruit. In others the thyroid is scarcely perceptible. Eye signs of exophthalmos, stare, fright and lid-lag may be present. Weakness, particularly of the leg muscles, is frequently mentioned. Nervousness and tremor of the outstretched hands is characteristic. Gastro-intestinal symptoms of excessive appetite accompanied by a diarrhea and loss of weight is a frequent occurrence. The skin is soft, thin and moist, especially of the hands. These patients do not tolerate heat well. They stand cold better than the average individual does. Crises and remissions sometimes occur. Thyroidectomies do not result in the high percentage of cures obtained in toxic adenomas. These patients tolerate quinine well as they appear to have an immunity against cinchonism. Iodine produces temporary remissions of symptoms and is the most popular drug used in its treatment. Its continued use is getting some unfavorable comments.

Toxic adenoma is found in individuals whose family histories record tumors, some located in the thyroids. This type of goiter is found in about equal number in males and females. They frequently appear at about the age of 20. Its development is comparatively slow, often taking fifteen years to produce symptoms. This type of goiter is frequently not profuse. The toxic adenoma patient and his family usually have nervous systems comparatively settled, steady and not of excitable nature. The predisposing cause of symptoms is supposed to be the tumor. The exciting cause is unknown.

A part of the picture such as enlarged thyroid, nervousness, tremor, tachycardia and increased basal metabolic rate is present as in Graves' disease. There are no eye signs. The physical signs of throb, thrill and bruit are absent.

The tumor may be large or small and frequently is nodular and noncompressible. If exophthalmos is present it is supposed to be complicated with the other type of goiter. Tachycardia is more apt to follow than precede the thyroid enlargement. The heart condition is more apt to improve with sleep and digitalis than in Graves' disease. Arterial tension may be raised above normal. Tremor is not constant. Weight loss is slower than in Graves' disease and not so marked. Weakness of the leg muscles is not a prominent symptom. Weakness from thyrotoxicosis does not dominate the picture. Skin texture is normal, sweating is not marked, dermatographia when present is mild. Heat emanation is not so evident as in Graves' disease. Mental excitement and history of nervousness are not the rule. Phlegmatic disposition preceding toxic symptoms is often observed. Crises and remissions are

Read at the annual meeting of the Southeast Missouri Medical Association, Cape Girardeau, October 3 and 4, 1939.



not frequent. Tendency to insanity and emotionalism is not above the average. Thyroidectomies result in a high percentage of cures except with malignancy. Postoperative thyroidectomy patients do not as a rule seek treatment elsewhere.

This type of goiter responds to no type of treatment except surgery. These patients do not have a ravenous appetite, gastro-intestinal symptoms or symptoms referable to the generative system. Psychic trauma plays no noticeable part.

It is thought possible for the two types of goiter to be present in one individual at the same time. It seems evident to me that in this type of goiter the toxic agent is developed in the thyroid gland and in the other it is developed in some other part of the body. The differentiation between goiter and other borderline conditions is sometimes difficult. Examples are tuberculosis, diabetes, Addison's disease and a few of the nervous conditions.

In our imagination let us view the goiter patients of both types under an unsuccessful period of iodine treatment by the general practitioner or family physicians. A little later we see them in the hospital following thyroidectomies. Next we find those who had toxic adenomas at home enjoying nearly 100 per cent cures while the patients with Graves' disease are divided, some in fine condition and others still making the rounds hunting for relief of their troubles. In this latter division some are with the surgeon, some with the radiologist, some with their family physicians, but many are in the hands of the cults, quacks and vendors. It is because of this situation that I have presented this paper.

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Histaminase failed to give relief to any of his fifteen patients with ragweed hay fever. Edmund L. Keeney, M.D., Baltimore, reports in *The Journal of the American Medical Association* for June 22.

"Since histaminase is advocated as a drug effective in controlling disorders of an allergic nature, it seemed that its benefits could be most accurately determined by its use in the treatment of patients with seasonal hay fever," he says.

"Histaminase was administered by mouth to fifteen patients with typical ragweed hay fever during the height of the 1939 ragweed season. It failed to give relief to any of the patients. Any fluctuation in symptoms that occurred could be accounted for by a concomitant fluctuation in the pollen concentration of the atmosphere."

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Although high blood pressure is frequently associated with serious disease, in some instances its occurrence is relatively unimportant and should cause no anxiety, Robert Sterling Palmer, M.D., Boston, declares in the July issue of *Hygeia, The Health Magazine*.

Furthermore, he points out, anxiety itself commonly causes the blood pressure to be twenty points higher and in some cases fifty or more points higher. Thus it is important to have one's blood pressure rechecked, in case it is abnormally high, in order to rule out this element of anxiety. Because the patient is nervous when the pressure is being taken, he is sometimes refused life insurance when the high reading is really not significant.

## PEPTIC ULCER

RECENT CONSIDERATIONS IN DIAGNOSIS AND TREATMENT

BRUCE KENAMORE, M.D.

ST. LOUIS

In a profession in which new approaches to the recognition of disease and improved means of therapy are constantly being added, it is well to pause occasionally and evaluate the changing methods. I wish to survey briefly a few of the recent innovations in the diagnosis and treatment of peptic ulceration.

The etiology of peptic ulcer remains unproven. Many theories are suggested, no one of which solves the problem. A few facts are established, however, and these are of definite therapeutic value: first, the disease affects males four times as frequently as females; second, it never occurs in the absence of free hydrochloric acid, and third, there is always some predisposing factor to altered gastroduodenal physiology. It is this last that admits of the numerous hypothetical causes of ulcer. Dietary and alcoholic abuses, irregular hours of eating and rest, foci of infections especially in the gallbladder and appendix, emotional crises and other disturbances lead to an upset in coordination of normal stomach and intestinal function.

The diagnosis of ulcer is usually not difficult clinically. The classical symptom of pain relieved by food, emphasized by Moynihan, is the typical chief complaint. Since other disorders causing reflex dyspepsia may mimic ulcer, it is always desirable to have roentgen ray confirmation of the diagnosis. The roentgenologist can show the lesion or rule out its presence in a high percentage of cases although a few probably will be missed even in the most expert hands.

A new method of roentgen ray examination which increases the accuracy of diagnosis is the use of compression technic with "spot roentgenograms." This has been employed in Germany for more than ten years but only now is being introduced in this country. A simple attachment to the fluoroscope is employed which permits a series of snapshots of the duodenal bulb. Incorporated in this is a device for compressing the stomach or duodenum during fluoroscopic visualization. With this mechanism one may get excellent films of the mucosal pattern. Templeton, at the University of Chicago, has shown that an additional 10 per cent of ulcers, not otherwise revealed radiologically, can be diagnosed by this method.

Another development of value in the diagnosis of gastric ulcer is gastroscopy. The Wolf-Schindler flexible gastroscope permits direct visualization of the interior of the stomach without danger or great discomfort to the patient. Duodenal lesions cannot be seen but gastric and marginal ulcers are readily recognized. The differentiation of ulcer and cancer

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Read at the meeting of the Frisco Railroad Medical Society, Tulsa, Oklahoma, October 24, 1939.

of the stomach, often difficult roentgenologically, is usually easy by the gastroscopic method. Likewise, some cases with epigastric symptoms which show nothing by roentgen ray have been found to have a gastritis when examined by this method. Marginal ulcers in a gastroenterostomy stoma are seen clearly through the gastroscope. This diagnostic aid is new and can be used only by one trained in the work. It rapidly is gaining acceptance, however, and soon should be available in all medical centers.

The treatment of peptic ulcer should achieve two aims, healing of the actual lesion and restoration of normal gastroduodenal physiology. One frequently sees recurrences following apparent complete healing of the original lesion. This can mean only that the factors predisposing to ulceration were not rectified in the plan of therapy. Recurrence or chronicity of symptoms indicates that the abnormal destructive conditions are overbalancing the body's constant efforts of repair and healing.

It has been shown clinically and experimentally that ulcers continue active when constantly bathed by gastric acid, while they rapidly heal if the acid stream is diverted or neutralized. Thus, the major alteration of gastroduodenal physiology previously mentioned is the hypersecretion of gastric free hydrochloric acid. Temporary use of antacids will neutralize this acid and permit healing of the lesion, but unless this neutralization is continued long after complete restoration of the mucosa, hypersecretion remains unchecked and new ulcers form. Correcting the factors producing this abnormal gastric secretion is the crux of the entire ulcer problem. If reflex irritation from the diseased appendix or gall-bladder is the cause, this is easily removed surgically. Where psychological disturbances serve as the predisposing factor, however, management is more difficult. Therefore, before prescribing diets and antacids one should study the individual in an effort to determine the predisposing factors in his case.

First among the medical measures for ulcer therapy which have changed in the last few years is diet. The old Sippy regime was satisfactory, temporarily, in controlling gastric acidity and healing but, if long continued, it produced a definite deficiency of the water soluble vitamins B and C. Since it has been shown that wound healing is delayed by vitamin C deprivation, this is a contributory factor to chronicity of ulcer. The excessively restricted older diet lists are being replaced by more liberal menus that include soft cooked vegetables, fresh fruit juices and lean, broiled meats on all but the acute ulcer regimes which are given only for the first few days. Concentrated vitamin preparations may be given in addition. Of utmost importance are instructions that meals and intermittent feedings be taken at the same time each day.

The choice of antacids probably is overemphasized today because of the many new proprietary products now widely advertised. The objections offered to the older powders composed of soda bi-

carbonate, calcium carbonate and bismuth are that, if used excessively, they produce an alkalosis, stimulate a compensatory acid secretion and their neutralization properties are not as great as the newer preparations. The two most popular recent drugs are aluminum hydroxide gel, marketed under such names as Ampho-gel and Creamalin, and magnesium trisilicate or triphosphate, sold under such trade names as Trisomin and Silnesia. While these products are undoubtedly superior to the old powders, their advantages are slight and the difference in cost scarcely justifies their use in patients of limited means. After all, all of us have prescribed calcium and soda freely and rarely have produced alkalosis or other harmful side effects.

In discussing therapeutic measures it is of interest to note two new experimental methods which as yet are not established or accepted. One is the use of powdered posterior pituitary reported last spring by Metz and his associates. In this study sixty-seven of seventy-six patients responded to the drug which was used without ulcer diets or antacids. If other investigators are able to verify Metz's results, this will be a valuable addition to the ulcer armamentarium.

In the other experiment deep roentgen ray therapy is given to the stomach producing a mucosal atrophy with resulting achlorhydria. While the achlorhydria will undoubtedly permit healing of the peptic ulcer, the frequent association of gastric atrophy and malignancy may materially increase the incidence of stomach cancer. It should be remembered that these are as yet only interesting studies in clinical research and are not recommended therapeutic measures.

Purposely, only the medical aspects of therapy have been considered. Difference of opinion still exists in choice of medical or surgical treatment for chronic peptic ulceration although the pendulum certainly is swinging to the medical side. Many feel that surgery should be reserved for complications of ulcer, namely: perforation and pyloric obstruction.

In conclusion, the use of combined fluoroscopic compression with spot radiography increases the accuracy of diagnosis. Gastroscopy is of definite benefit in distinguishing benign and malignant ulcers as well as revealing gastritis not otherwise demonstrable.

Therapeutically, the newer antacid preparations, aluminum hydroxide and magnesium trisilicate, have certain theoretical advantages but, practically, these do not give better results than the older antacid powders. The essential point in the management of peptic ulcer is persistence in treatment and removal of predisposing factors when this is possible.

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#### BIBLIOGRAPHY

1. Moynihan, B. C. A.: *Peptic Ulcer*, Philadelphia, W. B. Saunders Co., 1912.
2. Berg, H. H.: *Röntgenunters. am Innenrelief d. Verdauungskanales*, Leipzig, Thieme, 1931.



3. Templeton, F. E., Marcovich, A. W., and Heinz, T. E.: Duodenal Ulcer: The Value of Roentgenologic Demonstration of Crater, *J. A. M. A.* **111**:1807, 1938.
4. Schindler, R.: *Gastroscopy, The Endoscopic Study of Gastric Pathology*, Univ. Chicago Press, 1937.
5. Jones, C. M.: *Gastroenterology*, New England J. Med. **220**:339, 1939.
6. Portnoy, B., and Wilkinson, J. F.: Vitamin C Deficiency in Peptic Ulcer and Hematemesis, *Brit. M. J.* **1**:554, 1938.
7. Einsel, J. H.; Adams, W. L., and Myer, V. C.: Aluminum Hydroxide in the Treatment of Peptic Ulcer, *Am. J. Digest. Dis. & Nutrition* **1**:513 (September) 1934.
8. Adams, W. L.: Critical Evaluation of Gastric Antacids, *Arch. Int. Med.* **63**:1030 (June) 1939.
9. Mutch, N.: Hydrated Magnesium Trisilicate in Peptic Ulceration, *Brit. M. J.* **1**:254, 1936.
10. Sandweiss, D. J.: Comparative Results With Dietetic, Parenteral and Surgical Treatment in Peptic Ulcer, *J. A. M. A.* **108**:700, 1937.
11. Metz, M. H., and Lackey, R. N.: Peptic Ulcer Treated by Posterior Pituitary Extract, *Texas State J. Med.* **34**:214, 1938.

## PREOPERATIVE MANAGEMENT OF THE CHILD PATIENT

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In certain sections of the United States and Canada the preoperative management of the infant and child is given more consideration than the preoperative management of adults, while in other sections of the country the preoperative management of the child is entirely overlooked and grossly neglected. All surgeons are sympathetic with the highly apprehensive child going to the operating room. It frequently excites the operating room staffs to hear a screaming child being anesthetized, and it completely unnerves the anesthetist when he is required to anesthetize a little tot with ethyl chloride or ether. But the more serious phase is the impression left with the child after the operation. Years afterward he remembers the ordeal and will often delay giving consent to operations when the delay may jeopardize his successful recovery. The psychic reaction of a normal child can be compared to that of an adult suffering from a toxic thyroid gland; yet how often does the surgeon give a child patient the consideration he gives a toxic thyroid patient?

It is the desire of every medical anesthetist to use as little anesthetic agent as possible to produce satisfactory anesthesia. They learn during their medical training that ether and ethyl chloride are protoplasmic poisons and that after every ether anesthetic certain pathologic conditions of tissue exist and the extent of this pathologic change depends upon the saturation of tissue with the anesthetic agent.

I will discuss some pathologic states that are often produced in children because of inadequate preoperative medication and consider the factor of acidosis and depletion of the glycogen reserve. Surgeons removing tonsils or doing some other minor procedure on children under general anesthesia seldom realize they are dealing with an individual who develops acidosis as rapidly under anesthesia

as a cachectic cancer patient and that the glycogen reserve of the liver is rapidly depleted. The child often cries a great deal and has overworked the suprarenal glands in his excitement of going to the hospital for an operation. The psychic reaction accelerates the metabolic processes to a high rate of speed and the carbohydrate reserve is often depleted and acidosis follows. This changes a child considered a good risk before entering the hospital to a bad risk the morning of operation. Barbiturates which are metabolic depressants will prevent the acceleration of metabolic processes if they are used in adequate doses as soon as the apprehensive child is admitted to the hospital. If the child has been crying or vomiting, fluids should be given under the skin, preferably Hartmann's solution. Glucose candy should be allowed freely.

Guedel states, "Difference in resistance to anesthesia is largely a difference in the metabolic state of the patient. The starting point of anesthetic induction varies with the metabolic rate, and the metabolic rate varies with many conditions at the time of the operation. These conditions are largely controllable." Thus, if the metabolic rate of a child patient safely can be reduced to a minimum, less anesthetic agent will be required to produce satisfactory anesthesia.

Estimated in calories per hour per square meter of body surface the metabolic rates of children compared to those of adults is shown graphically in a chart compiled by Shimer (fig. 1). Because of the high metabolic rate of children and infants more than 1 year of age they are able to take safely relatively larger doses, per pound of body weight, of sedatives than adults; these sedatives are catabolized and excreted more rapidly in children than in adults.

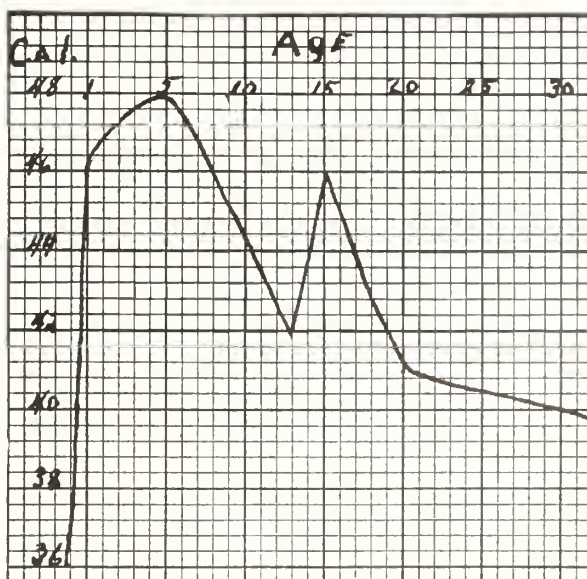


Fig. 1. Metabolism curve in normal person from birth to 30 years in calories per hour per square meter of body surface. (Compiled by Dr. Will Shimer, Indianapolis.)

The barbiturate which seems to have the most consistent effect in my experience is nembutal and the dose may be calculated according to Young's and Cowling's rule, or table 1 may be followed.

Table 1. *Nembutal Dosage*

Age	Nembutal Orally	Nembutal Rectally
4	$\frac{1}{4}$ gr.	$\frac{1}{2}$
6	$\frac{1}{2}$ gr.	$\frac{3}{4}$
8	$\frac{3}{4}$ gr.	1
10	1 gr.	1
12-14	1 gr.	$1\frac{1}{2}$

If preferred the nembutal can be given rectally by dissolving the powder in about a half ounce of water and inserting well up into the rectum, guarding against its expulsion for a few minutes after its administration. If barbiturates cannot be taken orally or rectally they can be given hypodermically in the form of sodium luminal in the same dosages as nembutal orally. This will usually insure a good night's rest before operation and keep the physiological processes nearer normal. On the morning of operation the medication tabulated in table 2 is given. The nembutal is administered one hour be-

Table 2. *Medication on Morning of Operation*

Years	Luminal <sup>1</sup> Hypodermically or Nembutal Orally	Morphine (Hypodermically)	Nembutal If Given Rectally
4	$\frac{1}{4}$ gr.	$\frac{1}{16}$ gr.	$\frac{1}{2}$
6	$\frac{1}{2}$ gr.	$\frac{1}{12}$ gr.	$\frac{3}{4}$
8	$\frac{3}{4}$ gr.	$\frac{1}{10}$ gr.	1
10	1 gr.	$\frac{1}{8}$ gr.	1
12-14	1 gr.	$\frac{1}{6}$ gr.	$1\frac{1}{2}$

fore operation and the morphine sulphate twenty minutes before the patient goes to the operating room.

If this preoperative medication is followed the child will not be apprehensive and will often require less than half the usual amount of anesthetic to produce the desired level of anesthesia. The post-operative course is much smoother, there is less nausea and vomiting and less abdominal distension. It is now known that morphine motivates the bowel and is more helpful than detrimental in abdominal distensions.

Children between the ages of 1 and 4 years, according to Robson, should not receive barbiturates; he recommends codeine gr.  $\frac{1}{4}$  hypodermically for children between the ages of 2 and 4. The 1 year old child should receive codeine gr.  $\frac{1}{8}$  one half hour before operation. No sedatives are used in children under 1 year of age.

Much has been written about basal anesthesia in children and it has been accepted readily in large pediatric centers. The agents most frequently used are nembutal, evipal soluble and avertin rectally. When these agents are used one is impressed with the quiet sleep they produce and more impressed with the quiet uneventful recovery and infrequent

nausea or vomiting. When basal anesthesia is used, the child does not struggle in the excitement stage of inhalation anesthesia and a small quantity of ether or gas is required to produce excellent relaxation. Basal anesthesia should not be used when an operative procedure is on the nose or throat, if it causes blood or mucus to collect in the oropharynx or when one desires the patient to be awake immediately after completion of the operation. Basal anesthesia is valuable in mastoid operations, laparotomies and surgical procedures on the extremities. It is used extensively in brain surgery. If basal anesthesia is used it should be administered by a competent anesthetist who has had considerable experience in basal anesthesia.

In closing something should be said about the preparation of the child for bronchoscopic examinations. Once a child has been through this ordeal it is often impossible to get any cooperation from him in subsequent examinations if he was not properly prepared for the first examination. S. S. Lyons, of Bellevue Hospital, has worked out the following routine in preparation for bronchoscopic examinations. An appropriate dose of an opiate and scopolamine is given one and one half hours before the examination. This is followed by avertin rectally, not using over 80 mg. per kilogram of body weight and given from twenty to thirty minutes prior to the examination. "To diminish the still active pharyngeal and laryngeal reflexes and at the same time assist in eliminating the cough reflex, from 1 to 3 cc. of a 3 per cent metycaine solution is sprayed into the oropharynx under direct vision." Five minutes later the child is anesthetized with nitrous oxide-oxygen and an endotracheal tube is inserted if lipiodol is to be injected. The lipiodol can be removed by suction through the endotracheal tube after roentgenograms have been made and the child will have no horror of the procedure if it has to be repeated at a later date.

## SUMMARY

Children over 1 year of age should have sedatives preoperatively. Children can tolerate relatively much larger doses of opiates and barbiturates than can adults. The child requires as much consideration preoperatively as the adult who is a poor risk. Proper preoperative preparation eliminates psychic trauma, lessens postoperative nausea and vomiting and reduces the quantity of anesthesia necessary to produce a desired level of anesthesia.

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## BIBLIOGRAPHY

- Guedel, A. E.: *Inhalation Anesthesia*, New York, Macmillan Co., 1935.  
 Guedel, A. E.: *J. A. M. A.* **82**:1736, 1924.  
 Robson, C. H.: *Am. J. Surg.* **34**:468, 1936.  
 Lyons, S. S.: *Anesth. & Analg.* **18**:168, 1939.  
 Beecher, H. K.: *Physiology of Anesthesia*, Oxford Medical Publications, 1938.  
 Mason, R. L.: *Preoperative and Postoperative Treatment*, Saunders & Company, 1937.



## CONVULSIONS

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"Convulsions" was selected as the title of this paper because it denotes a symptom rather than a disease entity. At present it is exceedingly difficult to name accurately the subject under discussion because, of late, there has been a tendency to describe the paroxysmal neuronal discharges in terms of electrophysiology or etiology rather than in terms descriptive of a clinical condition. The Gibbises and Lennox<sup>1</sup> have suggested the term, "paroxysmal cerebral dysrhythmia" and to this has been added the subheadings, "with clinical signs" and "without clinical signs."<sup>2</sup> When a patient is seen by the practitioner, however, the two questions foremost in his mind are: First, what is causing this patient to have recurrent convulsions and, second, what can I do to stop them?

Let us first examine the former question. The causes of convulsions are endless and it would be of little value to enumerate as many as we now know. One cannot approach the problem of etiology without considering the age of the patient. At different periods of life, first one factor and then another assumes primary importance. As a result, one must divide the life span into various periods and examine each one independently. The young child perhaps is subjected to more factors which can cause seizures than an individual in any other age group. First, in the newborn, in passage through the birth canal the head is subjected to numerous hazards. Perhaps 15 per cent of convulsions occurring first during the childhood period are due to birth injuries. A history of prematurity, prolonged labor, extreme molding, cyanosis and lethargy, difficulty in nursing or asphyxia pallida suggest the future possibility of convulsions due to some degree of intracranial hemorrhage or injury.<sup>3</sup> In these cases the convulsions usually occur soon after birth. Also, during the embryonic life of the infant and during labor potentialities are established for defective anlage which may cause convulsions later in life. Precipitate labor and falls also may lay the foundation for an intracranial pathologic condition resulting in fits. During the first few years of life acute infections associated with high fever frequently cause isolated seizures or perhaps rarely recurring seizures associated with an acute infection on each occasion. These seizures may never recur, but a certain percentage of epileptic patients later in life give a history of isolated seizures during the first few years. During the period from 3 to 10 years of age, when most childhood diseases occur, there is the possibility of encephalitis associated with such conditions as measles, whooping cough, varicella, vaccinia and mumps. Convulsions due to birth injury or defective anlage may show up at this time. Perhaps it is just as well to discuss idiopathic epilepsy at this

time as at any other. The word "idiopathic" is in itself merely an admission of our ignorance of the etiologic factor in a certain group of individuals with convulsive seizures. As our knowledge of pathology, physiology and chemistry has increased this group has grown progressively smaller and perhaps in the future will be abolished. It also should be mentioned that external trauma, not associated with birth injury, at any time may cause cerebral defect with convulsions. These convulsions may begin anywhere from one month to sixteen or more years after injury, the average being about eighteen months. At the age of puberty, possibly due to endocrine factors with alterations in the chemistry of the individual together with associated emotional readjustments, perhaps the greatest incidence of the first seizure is found. In girls it is frequently associated with the onset of menstruation and may remain so associated. It has been estimated<sup>4</sup> that over 50 per cent of all cases of chronic convulsions have their onset at this time of life.

Next is the period of early adult life, between the ages of 18 or 20 and 40 or 45. Provided no obvious etiologic factor is present, such as trauma, hypertension or alcoholism, fully 70 per cent of these individuals who suffer convulsions have brain tumors. When the presenting symptom in this group is a convulsion and is not associated with other organic neurologic symptoms, the tumor most likely is located in one of the frontal poles, particularly on the right, or in the parasagittal region. Astrocytomas are somewhat more prone to initiation by convulsion than are the more benign meningiomas.

Between the ages of 45 and 60 one most frequently finds hypertension associated with encephalopathy and chronic alcoholism as the most common causes, keeping in mind of course again that trauma always must be considered. Frequently one finds more than one factor present. While convulsions are frequently seen with subdural hematomas in infants, they are a rare occurrence in adult life. Occasionally acute apoplexy is ushered in with a convulsion, and at times individuals with paresis and meningovascular syphilis may have recurrent transient attacks associated with convulsive phenomena. Some brain tumors may occur at this age period, but the type occurring at this time more frequently is associated with marked organic neurologic findings so that the diagnosis is seldom in doubt and the convulsion is often merely a minor symptom in the complex presented by the patient. Beyond the age of 60 there is a small group of patients having convulsions on a purely arteriosclerotic and degenerative basis, not associated particularly with hypertension, alcoholism or other secondary factor. It should be pointed out that convulsions may begin violently with grand mal attacks or begin mildly with petit mal or partial seizure gradually increasing to grand

mal. In general, it might be said that the milder onsets are apt to occur in younger individuals.

In considering the individual convulsion there are numerous factors which may precipitate an attack, but these will be considered under treatment rather than at the present time. That the factors so far are in reality only secondary seems to be the current feeling. All have seen individuals with severe head trauma. Only a certain percentage of these individuals develop convulsions. The same principle holds good for all other exciting causes, so the question now is: What is the nature of the predisposing mechanism, that mechanism which makes one individual subject to convulsions and another individual not subject to them?

Recently, some evidence has accumulated pointing to an hereditary factor in epilepsy. Lennox and his coworkers<sup>5</sup> in an examination of 138 relatives of epileptics found a cerebral dysrhythmia by electro-encephalography in 54 per cent. Wave alterations were questionable in 11 per cent. In forty-six cases both parents were examined. Twenty-eight per cent of these cases had dysrhythmia in both parents. In 94 per cent of the cases at least one of the parents showed abnormality. In 4 per cent one was normal and one doubtful and in only one case were both normal. Löwenbach<sup>2</sup> at Johns Hopkins examined thirty-seven healthy members in the family of a single epileptic; seventeen had what he considered an abnormal electro-encephalogram and four had plainly seizure waves. This evidence must be considered cautiously at the present time in view of our inadequate knowledge of the basic meaning of wave patterns. At the most, one should conclude that a basic instability might be inherited rather than epilepsy.

The electro-encephalogram, while showing alterations in activity, is probably only an indirect demonstration of fundamental normal and abnormal physicochemical mechanisms. A brief review of some of the recent experimental work in this particular field might be considered. Membrane permeability appears to be one of the important fundamental determining factors in convulsive phenomena. Alterations in membrane function may occur within the central nervous system at two sites: first, at the hemato-encephalic or hemato-cerebrospinal fluid barrier and, second, at the actual neuron cell membrane within the cortex. Cobb, Cohen and Ney<sup>6</sup> found that by injecting brilliant vital red in chronic epileptics 50 per cent definitely were benefited. Aird,<sup>7</sup> in attempting to explain the mode of action of this dye, found, histologically, that it was located almost entirely in the endothelial barrier between the blood and spinal fluid within the central nervous system. In his experiments on animals he used cocaine, a cortical convulsant, to produce seizures and was able to verify the fact that brilliant vital red did protect both men and animals from convulsions. By estimating the quantity of cocaine and radioactive so-

dium on either side of the barrier he was able to conclude that the decreased permeability was the important factor involved. In attempting to apply this finding clinically he postulated that minimal generalized toxemias which might be insufficient to penetrate a normal barrier would be able to get through the barrier of an epileptic with increased permeability. This may be the explanation for the increased susceptibility in women to convulsions at the menstrual and premenstrual periods since at that time the permeability of the barrier is increased as shown by Heilig and Hoff,<sup>8</sup> and Benda.<sup>9</sup> Some of these minimal toxemias postulated might be merely slight alterations of normal metabolism, perhaps accentuated at times of emotional disturbance or fatigue. It also has been shown that the blood-fluid barrier is impaired by injuries and infections and this impairment may persist for some time. Even though increased permeability of the hematocerebrospinal fluid barrier may cause convulsions, this mechanism is probably dependent upon a more primary abnormal state in the actual brain cells.

Gibbs, Gibbs and Lennox<sup>10</sup> believe that the abnormal rhythms, as manifested in the electro-encephalograms, are merely, as stated before, associated with changes in the irritability of the center from which the abnormal activity is obtained. The primary disturbance in the rate regulating mechanism seems to be due to stimulation occurring in so-called "sick cells." Stability seems to be lacking with a lack of control of swing to either fast or slow rhythm. This is the reason given for the increase in seizures on going to sleep or on awakening, psychomotor in the former case and grand mal in the latter. Spiegel and Spiegel-Adolph<sup>11</sup> attempted to investigate this hyperirritability by electrical methods. They used polarization as an index of ionization and thus indirectly of membrane permeability, and showed that anoxemia, alkalosis, hyperventilation and hydrosis lower the density of cell membranes and induce changes in ion concentration. Due to the effect upon the cell membranes, the increase in permeability, which is an essential part of the excitation process, is facilitated and normally subliminal stimuli may become effective. Conversely, lipoid soluble anesthetics and hypnotics increase the density of the cell membranes and decrease the irritability of the cell.

McQuarrie and his workers<sup>12</sup> showed that in epilepsy there is a high lecithin-cholesterol ratio. These substances are essential elements of the cell membrane and of importance in determining its semipermeable characteristics. It has been shown<sup>13</sup> that cholesterol diminishes permeability and has a narcotic action, while lecithin increases permeability and has an antinarcotic action. Cholesterol also retards the flow of potassium ions through the membranes and it is the potassium which increases the hygroscopic action of lecithin. Hirschfelder and Haury<sup>14</sup> showed that the ratio of the potassium ions



to magnesium ions in the blood is increased in convulsions. All these factors point to a rather fundamental relationship of cholesterol to the irritability of the nerve cell through its influence on such fundamental functions as water metabolism and acid-base equilibrium, excitation and conduction in protoplasm, and cellular oxidation. Aird and Gurchot<sup>13</sup> showed that by injecting cholesterol parenterally they not only could raise the amount of the convulsant necessary to cause a seizure, but also could increase the latent period between the injection and the onset of the convulsion. This, they attributed to decreased permeability of the nerve cell membrane. They also believe that the cholesterol might act by preventing adsorption by the cell membranes of drugs or circulating metabolic products which tend to lower the permeability of the cell membrane to oxygen, the anoxemia thus causing an increase in intracellular metabolites.

Consequent hyperreactivity then would be avoided. So we find a dynamic state existing between the cell and its environment. Alterations in the environment profoundly affecting the cell membrane and the cell membrane not only affect the external environment but also the internal environment of the cells. Thus the cell membrane assumes primary importance as the "final common pathway" for the production of an intracellular state necessary for hyperirritability, this state probably being cellular anoxemia. *Anoxia.*

Another possible dynamic factor in the convulsive mechanism was pointed out by Gellhorn, Darrow and Yesinick.<sup>15</sup> They showed that by giving physiological doses of epinephrine intravenously the tonic component of the convulsions could be made to disappear completely and either a great reduction or complete cessation in the clonic movements of a convulsion resulted. This inhibition was related to the rise in blood pressure and dependent on the buffer nerves of the carotid sinus mechanism and vagus nerves. Haas<sup>16</sup> showed that the acetyl choline content of the brain is reduced after epinephrine, and if one considers the role acetyl choline plays in the transmission of nerve impulses and assumes that this role is present within the central nervous system, the additional chemical features of the action of epinephrine are apparent. Gellhorn and his coworkers believed that some disturbance in epinephrine action may be present in individuals subject to convulsions. Alteration in the carbon dioxide content of arterial and jugular blood has been demonstrated in both grand and petit mal attacks, in the former abnormally high, and low in the latter. These changes immediately precede spontaneously occurring seizures.<sup>23</sup> Further, in a more detailed study of petit mal types Nims<sup>24</sup> and his coworkers found additional evidence for the impaired control of the acid base balance during periods of overventilation. The CO<sub>2</sub> content of the internal jugular blood reached a lower level and maintained that level longer than

the nonepileptic. Recently Wolff and Goodell<sup>25</sup> reported finding "sluggish endogenous calcium metabolism" in convulsions. Thus, one can see how intricate even the few known factors are in the mechanism of convulsions and how interrelated so many of these are to each other. It is also well to keep in mind that much of the experimental data not only has been obtained from animals but has been procured after either chemical or electrical stimulation. To utilize this material in the study of spontaneous human convulsions is hazardous and based only on inference. A tremendous amount of work remains to be done before there will be any more definite concept of the basis for convulsions.

I would like to discuss some aspects of treatment, some of which are new and some long known but little used and yet of value. It is hardly worth while to discuss the use of luminal and bromide. It is sufficient to say that both drugs are of extreme value—the former principally in the grand mal type of attack and the latter in the petit mal. About fifteen years ago, Elsberg<sup>17</sup> and his associates showed that the convulsive threshold was decreased in thyroidectomized animals and increased when thyroid was given. This point has been used clinically in the treatment of some cases which were somewhat refractory to luminal and bromides. Frequently the addition of a small amount of thyroid will abolish completely the few seizures not controlled by the sedative drugs. Some cases, however, are not benefited by thyroid, and Doolittle<sup>18</sup> has concluded in a large series of cases that those patients with an unstable diastolic blood pressure do not do well on thyroid. Many have used the ketogenic diet and limited fluid intake which are probably of little value in grand mal attacks but, in the opinion of many experienced neurologists, are of definite aid in the petit mal. By using the electro-encephalogram, it has been shown that the wave-spike type is sensitive to an increase in CO<sub>2</sub> blood tension. Gibbs, Gibbs and Lennox<sup>19</sup> were able to abolish this type of wave by increasing the blood sugar level. If hypoglycemia was precipitated with insulin, the seizures were increased greatly in number and then when dextrose was given to increase the blood sugar level the seizures rapidly decreased and, strangely enough, remained decreased for two or three days. This technic, as far as I know, has not been used clinically.

Within the last two years, Merritt and Putnam<sup>20</sup> have examined a large group of drugs to determine their anticonvulsant action. In this group was sodium diphenyl hydantoinate (or dilantin sodium for short). This drug has been proven of inestimable value in the treatment of chronic convulsions. In their original series only those cases which did not respond to luminal and other types of treatment were used. In 79 per cent of these cases dilantin proved to be more effective than any other type of therapy and in only two cases was

previous treatment of greater benefit. Since then, numerous reports have appeared in the literature, all confirming the benefits of this new anticonvulsant. It is prepared in 1½ grain capsules and the dose is usually begun at 3 grains per day and increased until an effective dose is reached. This is usually 4½ or 6 grains a day; 7½ and 9 grains have been given but are rarely necessary. The capsules are given with meals in order to prevent any mild nausea or anorexia.

The toxic effects of the drug are usually mild.<sup>21</sup> In the gastro-intestinal system they usually consist of epigastric discomfort, nausea and occasional vomiting. These symptoms usually can be prevented by giving the capsules with meals, as stated before, or by giving them with a small amount of dilute hydrochloric acid. The effects on the nervous system are usually only present with large doses and consist of tremors of the hands, ataxia, diplopia, nervousness and occasional headaches. In contrast to luminal or bromides, which have a sedative action, dilantin may be stimulating so that the patients have a feeling of well-being and are even somewhat hypomanic at times. Skin lesions occasionally are seen and may vary from a mild erythema of the neck and arms to a more severe generalized rash and an occasional case has been observed with blebs and desquamation. The skin lesions usually occur between the seventh and fifteenth day of treatment. Exfoliative dermatitis and purpura have been noted and so far constitute the only toxic effects necessitating complete discontinuation of the drug. A peculiar hypertrophy of the gums has been noted in about 6 per cent of cases, chiefly in children and young adults. The gums are firm, not painful, and there is no bleeding. The mechanism of this hypertrophy is not known. The blood picture occasionally shows a slight secondary anemia or a transient reduction in white blood cells. At times, a mild leukocytosis or eosinophilia has been observed. Most of the mild toxic reactions have been seen in those cases in which the larger doses have been given. Reducing the dose or temporarily discontinuing the drug until the toxic manifestation has disappeared has been the only treatment necessary. The greatest benefits from dilantin have been seen in the grand mal cases. While it has some effect in the petit mal, it has not been so successful in controlling this type. Occasionally, one encounters a grand mal case, sometimes post-traumatic, that seems to be made worse by this drug, but, taking everything into consideration, it is an exceedingly valuable adjunct to our armamentarium.

The question of surgery in the convulsive patients remains to be discussed briefly. If a given case fails to respond to the usual anticonvulsant measures or convulsions seem directly due to trauma, an attempt should be made to localize a focus from which the seizures originate. The means at our disposal are the neurologic examination it-

self, the description of the seizure, encephalography with air and the electro-encephalogram. Should a focus be found, surgery may be indicated. Some difference of opinion exists as to whether those cases which have a focus, but which respond to medication, should be operated on. My own feeling is that they should not be operated on. Naturally those cases with a focus which do not respond to medication should be treated surgically. The pathologic condition seen at operation may be one of several types. First, of course, it may be a tumor and, if so, an attempt should be made to remove the lesion. Scars, degenerative areas and porencephalic cysts have been noted. Recently, another type of lesion, congenital in origin, has come into some prominence. These are the so-called "microgyria." Penfield<sup>22</sup> believes that during childbirth actual pressure on one convolution or a group of convolutions may be greater than elsewhere, so that if the blood supply through the umbilical cord is compromised, ischemia may be produced in that convolution or convolutions which is greater than the ganglion cells can tolerate. The latter are irretrievably damaged by a few minutes of complete ischemia, while the interstitial neuroglial cells and pia mater may easily survive. This results in a small shrivelled gyrus with few or no adhesions and without evidence of early hemorrhage. The result of the decrease in convolutions on the one side may result in that half of the vault being smaller than the other side. Porencephalic cysts are usually caused by complete occlusion of one of the larger cerebral arteries in utero or during the first year. If possible, the cyst should be excised, and certainly a fistula with the ventricle established. If partial damage is done to the blood supply of an area of the brain, either through trauma or compression, a scar may result and act as a focus. It should be noted that it is the transition zone between the completely degenerated area and the normal zone that acts as the focus of origin of the seizure and it is this area which, when stimulated electrically, reproduces the clinical seizures. Operations for foci have been moderately successful. Perhaps from 25 per cent to 30 per cent are completely relieved and another 20 per cent improved, those cases associated with trauma showing the best results. Oral medication with one of the anticonvulsants must be continued for at least six months.

Finally, I want to stress the treatment of the patient as a whole. Drug medication is not sufficient to obtain maximum improvement in any case. The patient must be taught how to live in a sensible manner. All stimulants must be removed. Smoking and alcohol are forbidden. The diet is bland. The patient must keep regular hours with sufficient bed rest and must at all times avoid over-exercise with associated fatigue. Of great importance is the matter of constipation. The bowels must be kept open at all times. And lastly, but cer-



tainly not of least importance, the patient needs adequate psychotherapy—first, to counteract the tendency toward invalidism apt to develop and, second, to straighten out any emotional difficulties which in any case may precipitate an individual seizure and certainly increase the total number in any given period of time.

In summary, the handling of convulsions must be individualized. The patient must receive a careful work-up. The etiology and treatment must be determined in the case at hand, making use of all the facts which are now at our disposal.

Missouri Building.

#### BIBLIOGRAPHY

1. Gibbs, F. A.; Gibbs, E. L., and Lennox, W. G.: Epilepsy, a Paroxysmal Cerebral Dysrhythmia, *Brain* **60**:377, 1937.
2. Lowenbach, H.: The Electroencephalogram in Healthy Relatives of Epileptics, *Bull. Johns Hopkins Hosp.* **65**:125, 1939.
3. Peterman, M. G.: Convulsions in Childhood: A Review of One Thousand Cases, *J. A. M. A.* **113**:194, 1939.
4. Fetterman, J. L., and Hall, V. R.: Mode of Onset of Epilepsy, *Arch. Neurol. & Psychiat.* **38**:744, 1937.
5. Lennox, W. G.; Gibbs, E. L., and Gibbs, F. A.: The Inheritance of Epilepsy, *J. A. M. A.* **113**:1002, 1939.
6. Cobb, S.; Cohen, M. S., and Ney, J.: Anticonvulsive Action of Vital Dyes, *Arch. Neurol. & Psychiat.* **40**:1156, 1938.
7. Aird, R. B.: Mode of Action of Brilliant Vital Red in Epilepsy, *Arch. Neurol. & Psychiat.* **42**:700, 1939.
8. Heilig, R., and Hoff, H.: Menstruation und. Liquor, *Klin. Wchnschr.* **3**:2049, 1924.
9. Benda, R.: Quoted by Aird.<sup>7</sup>
10. Gibbs, F. A.; Gibbs, E. L., and Lennox, W. G.: Cerebral Dysrhythmias of Epilepsy: Measures for Their Control, *Arch. Neurol. & Psychiat.* **39**:298, 1938.
11. Spiegel, E. A., and Spiegel-Adolph, M.: Physico-Chemical Mechanisms in Convulsive Reactivity (Permeability Changes Induced by Epileptogenous Agents and by Anesthetics), *J. Nerv. & Ment. Dis.* **90**:188, 1939.
12. McQuarrie, I.; Husted, C., and Bloor, W. R.: Lipids of Blood Plasma in Epilepsy: Variations of Lipids in Relation to Occurrence of Seizures, *J. Clin. Investigation* **12**:255, 1933.
13. Aird, R. B., and Gurchot, C.: Protective Effect of Cholesterol in Experimental Epilepsy, *Arch. Neurol. & Psychiat.* **42**:491, 1939.
14. Hirschfelder, A. D., and Haury, V. G.: Variation in Magnesium and Potassium Associated With Essential Epilepsy, *Arch. Neurol. & Psychiat.* **40**:66, 1938.
15. Gellhorn, E.; Darrow, C. W., and Yesnick, L.: Effect of Epinephrine on Convulsions, *Arch. Neurol. & Psychiat.* **42**:826, 1939.
16. Haas, H. T. A.: Untersuchungen uber die pharmakologische Beeinflussung vegetativer Zentren: II, *Arch. f. exper. Path. u. Pharmacol.* **192**:117, 1939.
17. Elsberg, C. A., and Stookey, B. P.: Studies on Epilepsy. I. Convulsions Experimentally Produced in Animals Compared With Convulsive States in Man, *Arch. Neurol. & Psychiat.* **9**:613, 1923.
18. Doolittle, G. J.: Thyroid Therapy in a Series of Epileptics, *Psychiatric Quart.* **13**:33, 1939.
19. Gibbs, F. A.; Gibbs, E. L., and Lennox, W. G.: Influence of the Blood Sugar Level on the Wave and Spike Formation in Petit Mal Epilepsy, *Arch. Neurol. & Psychiat.* **41**:1111, 1939.
20. Merritt, H. H., and Putnam, T. J.: Sodium Diphenyl Hydantoinate in the Treatment of Convulsive Disorders, *J. A. M. A.* **111**:1068, 1938.
21. Merritt, H. H., and Putnam, T. J.: Sodium Diphenyl Hydantoinate in the Treatment of Convulsive Seizures: Toxic Symptoms and Their Prevention, *Arch. Neurol. & Psychiat.* **42**:1053, 1939.
22. Penfield, W.: The Epilepsies: With a Note on Radical Therapy, *New England J. Med.* **221**:209, 1939.
23. Gibbs, E. L.; Lennox, W. G., and Gibbs, F. A.: Variation in the CO<sub>2</sub> Content of the Blood in Epilepsy, *Arch. Neurol. & Psychiat.* **43**:223, 1940.
24. Nims, L. F.; Gibbs, E. L.; Lennox, W. G.; Gibbs, F. A., and Williams, Denis: Adjustment of Acid-Base Balance of Patients With Petit Mal Epilepsy to Overventilation, *Arch. Neurol. & Psychiat.* **43**:262, 1940.
25. Wolf, H. G., and Goodell, Helen: Calcium Metabolism in Patients With Convulsions. Read before the American Psychiatric Association, May 20, 1940.

Bloodletting from a vein (venesection) kept a hemophilic patient or hereditary bleeder free of symptoms for seven years, George B. Lawson, M.D., Roanoke, Va., and A. B. Graybeal, M.D., Marion, Va., report in *The Journal of the American Medical Association* for June 8.

## CASE REPORTS

### THE MISSOURI SALES TAX TOKEN AS A NEW AND RELATIVELY COMMON FOREIGN BODY REQUIRING REMOVAL FROM ESOPHAGUS AND PHARYNX (31 CASES)

WILLIAM A. MARMOR, M.D.

ST. LOUIS

The retail sales tax has become increasingly popular as a method of raising state revenues and, with the development of the 1 per cent and 2 per cent tax and in some states 3 per cent tax, it has become necessary to devise some convenient method of handling the fraction of a cent to be collected on sales on which the tax is less than 1 cent. At present eighteen states are using some kind of a metal token of less than 1 cent denomination. Most of these tokens are made of aluminum but the Missouri Sales Tax Law states that the tokens must be made of Missouri mined ore and as zinc and lead are the only metals found in commercially available quantity in Missouri the zinc token was selected.

The selection of the size and shape of these tokens must be considered carefully from an economic standpoint because of the many slot coin operated devices used commercially which are made to fit a penny, nickel, dime or quarter as well as the coin counting and packaging machines used by banks and cashiers. The mill tax token must be a coin of such a shape and size that it will not register in a slot machine and not be readily reducible to the size of a higher valued coin.

On July 1, 1937, the State Collector of Revenue of Missouri made available to the general public zinc sales tax tokens of 1 and 5 mill denominations replacing the old temporary pasteboard tokens. The 1 mill tokens are circular zinc disks 23 mm. in diameter and 1 mm. in thickness and the 5 mill tokens are the same size with a 3.5 mm. hole in the center. The accompanying photograph shows the relative size of the Missouri sales tax tokens as compared with the common federal coins.

The esophagus in the child, because of its marked elasticity and mobility, has no normal or determinable average diameter, but it is common clinical knowledge that a dime or penny swallowed by a child of from 1 to 4 or 5 years will pass through an anatomically and physiologically normal esophagus into the stomach and through the gastro-intestinal tract if given enough time. If the coin is a nickel it will usually pass although there have been occasional cases where, in a particularly young infant or in the presence of some minor anatomical abnormality, it has been necessary to remove a nickel by endoscopy. Frequently, with the introduction of the esophagoscope for removal of a nickel, the

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spasm is apparently relieved and the nickel miraculously disappears down the esophagus and into the stomach before the operator can seize it with a forceps.

On July 1, 1939, a questionnaire was sent to all hospitals in Missouri having a capacity of fifty beds or more requesting information on cases in which Missouri sales tax tokens had been swallowed necessitating removal or attempted removal by endoscopy. Specifically requested were number of cases, age, method of removal and results. It was thought that hospitals smaller than fifty bed capacity would be unlikely to have equipment for endoscopy.

Reports were received from all the hospitals contacted and a total of thirty-one cases including three of my own were reported throughout the state in this period of two years. One case, a child of 3 years, had two tokens removed from the esophagus. That this is a relatively large number of cases can be readily understood when one considers how rarely it was necessary to remove coins from the esophagus previously.

The average of the ages of these patients was 3 years and 5 months and almost without exception the foreign body was located in the esophagus in the transverse plane at a level immediately above the inlet to the thoracic cage where the natural narrowing is too great to be overcome by peristalsis and where the contracted cricopharyngeus muscle above the coin prevents regurgitation.

The method of removal was reported to be by endoscopy in all but one case. This case is worthy of note in so far as the foreign body was dislodged in some other manner apparently under fluoroscopic guidance. The success of this maneuver must be considered due to good luck rather than good technic and it should be discouraged in favor of the much safer and surer endoscopic methods available.

The accepted endoscopic technic is to expose the edge of the coin below the cricopharyngeus muscle with the esophageal speculum or the esophagoscope, without general anesthesia, grasp the foreign body with a suitable forceps and remove the foreign body together with the forceps and the esophagoscope.

I am happy to report that all thirty-one cases resulted in the safe removal of the foreign body without mishap and all cases resulted in complete recovery. I consider this a fine tribute to Dr. Chevalier Jackson and his coworkers and contemporaries in the pioneer work in endoscopy and in their willingness to teach and train others to save these cases which only a few years ago were considered to be hopeless.

#### CONCLUSIONS

1. From a public health viewpoint the selection of the present zinc Missouri sales tax tokens with regard to size and shape was unwise because the public is careless with a coin of such small value and give them to small children to play with. Previously the smallest coin requiring removal by endoscopy was a quarter and few children under 4 years in these times get their hands on enough quarters to do any harm.

2. From an endoscopist's point of view the sales tax token should be smaller than a nickel if round or smaller than a dime if any other shape.

3. It is imperative that we go ahead with our public health problem of acquainting mothers with the dangers of allowing small children to play with any object that might become harmful if the child were to put the object in its mouth and swallow or aspirate it.

634 North Grand Boulevard.

## HEREDITARY DEFORMING CHONDRODYSPLASIA

C. A. W. ZIMMERMANN, M.D.

CAPE GIRARDEAU, MO.

#### REPORT OF TWO CASES

Hereditary deforming chondrodysplasia, while perhaps not rare, is sufficiently uncommon to be of reportable interest. Absence of the hereditary element so greatly stressed by most authors and the present confusion about the condition are the reasons for this presentation of two cases. The following numerous synonyms bespeak the confusion: multiple cartilaginous exostoses, multiple congenital chondromata, hereditary multiple exostoses, diaphyseal aclasis, dyschondroplasia, Ollier's disease. How old this disease is may not be known but being based on developmental defects it is probably as old as man.

No attempt was made to search the literature thoroughly but a few notations from a number of

Read at the annual meeting of the Southeast Missouri Medical Association, Cape Girardeau, October 3 and 4, 1939.

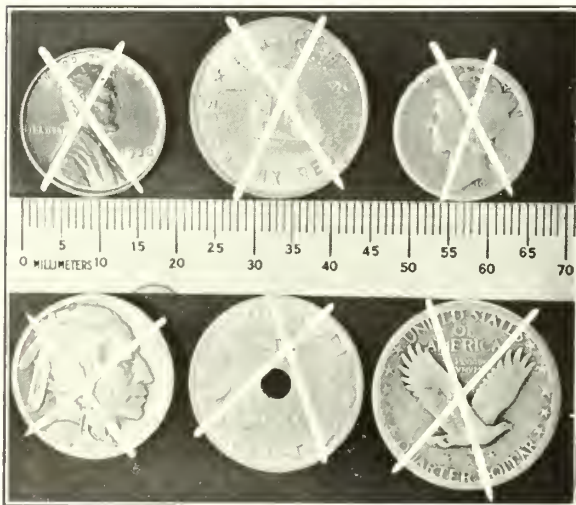


Fig. 1. The relative size of the Missouri sales tax token and other coins.



authors along the years may be of interest. If Hippocrates knew of this disorder, any expression thereof by him escaped my observation. Some of the older textbooks on pathology, Hartmann,<sup>1</sup> Billroth<sup>2</sup> in two editions, and Ribbert<sup>3</sup> give attention to the subject and attempt (the last two) to explain its occurrence while more recent authors treat the subject as a step child. Tillmanns,<sup>4</sup> writing in 1915, stresses the hereditary feature and quotes Heymann as having observed an afflicted phthisical patient whose mother, four brothers and three children suffered from this bone disease. Also he quotes Reineke as having collected thirty-six reports of cases of multiple exostosis from the literature in which the hereditary predisposition could be traced back in one case five generations, in fifteen cases three generations and in twelve cases two generations. Dr. Reuben Alley,<sup>5</sup> writing in 1937, reports a "family of four possibly five" cases of this disease, one perhaps a variant and he considers that he reveals transitions between single exostoses and fully developed hereditary deforming chondrodysplasia. Roland Scott<sup>6</sup> reports five cases in a Negro family and stresses the hereditary feature. He comments that the first case reported in this country was in 1875 by Gibney and that the condition received little recognition thereafter until in 1915 Ehrenfried found evidence of hereditary influence in 176 out of 236 cases. The infrequent occurrence of this disorder as compared to other types is indicated in an article by Meyerding<sup>7</sup> in which he reports a series of 265 cases of exostosis none of which fit in this category. Brailsford<sup>8</sup> presents a graphic pedigree which indicates that both father and mother transmit the disease to daughter and son. This author observes that the dystrophy is evidenced radiographically in infants before the appearance of epiphyses by small bony buds from the sides of the diaphyseal extremities.

The most complete and elucidating article on this subject was written by Geschickter and Copeland.<sup>9</sup> On their work the following discussion is based, much of it taken verbatim. These authors begin their studies in embryology and call attention to the primitive connective tissue which has the power to form cartilage and bone and from which all components of bone are derived. They correct the erroneous impression that the permanent bony skeleton is achieved early in adult life by asserting that the development of the skeleton is never complete and that there are always places where transitional forms between the different tissues persist, each offering a possibility of tumor formation. Particularly do strands of connective tissue persist in the neighborhood of articulations they have formed as well as beyond and at the points for attachment of tendons and ligaments. The tendon ends also are possessed of precartilaginous connective tissue capable of forming cartilage.

It seems then that the exostoses are formed from the precartilaginous connective tissue of the ten-

don undergoing the transitions to cartilage and to bone, the growth being directed shaftward. From the other side there is an "outpouring" of bone through a periosteal gap of the shaft which meets the tendon's effort. This process takes place most frequently at points in the bone where protuberances for attachment of tendons are to be formed. The exostoses are directly continuous with the shaft of the bone and are made up of cortex and cancellous tissue. One notices then a bony growth capped by cartilage covered by connective tissue. In every case there is some factor by which periosteum does not limit the exostosis to the size of a normal protuberance by the formation of a limiting cuff. In the multiple type the perichondrium is extensively at fault since it so slowly becomes periosteum and forms a bar to adequate osteoblast formation. Hence there is loss of growth control accounting for the wide diaphyses and thin cortex and in addition creation of gaps for the escape of bony structures to form exostoses. In the case of the fibula and ulna, fusion with their respective tibia and radius frequently takes place in which instance the lesser bone, following Wolff's law which dictates that the development of bone structure is in accordance with bone stress and strain, is arrested in its development, great deformities resulting. A difference between the single and multiple exostoses is that the latter harbor at their bases irregular masses of cartilage growing inwardly forming central chondromas. The exostoses point in the direction of the pull of the tendons attached to them.

Whether the exostoses cause symptoms depends on their location. While essentially benign they may be innocent, yet are capable of causing distress and damage by impinging on other structures as nerves, joints, arteries and spinal cord.

As to the cause of the disease, no acceptable factor has been advanced.

Prognosis as to recovery is not good. Malignancy as a complication must be watched for although apparently it is not frequent. Treatment consists in properly removing annoying growths.

#### CASE REPORTS

Case 1. Male, farmer, was referred by Dr. O. J. Miller who had been consulted about a lump in the patient's right scapular region in 1927 when the patient was 50 years old. He is still alive and active (August 1939). This lump is a nodular painless mass which seems much larger than the film indicates and is fixed to the right scapula with which it moves, the skin being free over it. The growth does not incapacitate but embarrasses somewhat the movements of his right arm. It causes a minimum of pain.

He has noticed some swelling about his knees to which he gave scant attention. He did not know just how long he had been afflicted but the swelling was present when as a small boy he went to country school. No member of his family had any disfigurement. All his life he had done his allotted share of farm labor and still does. There are no indications of general systemic disease.

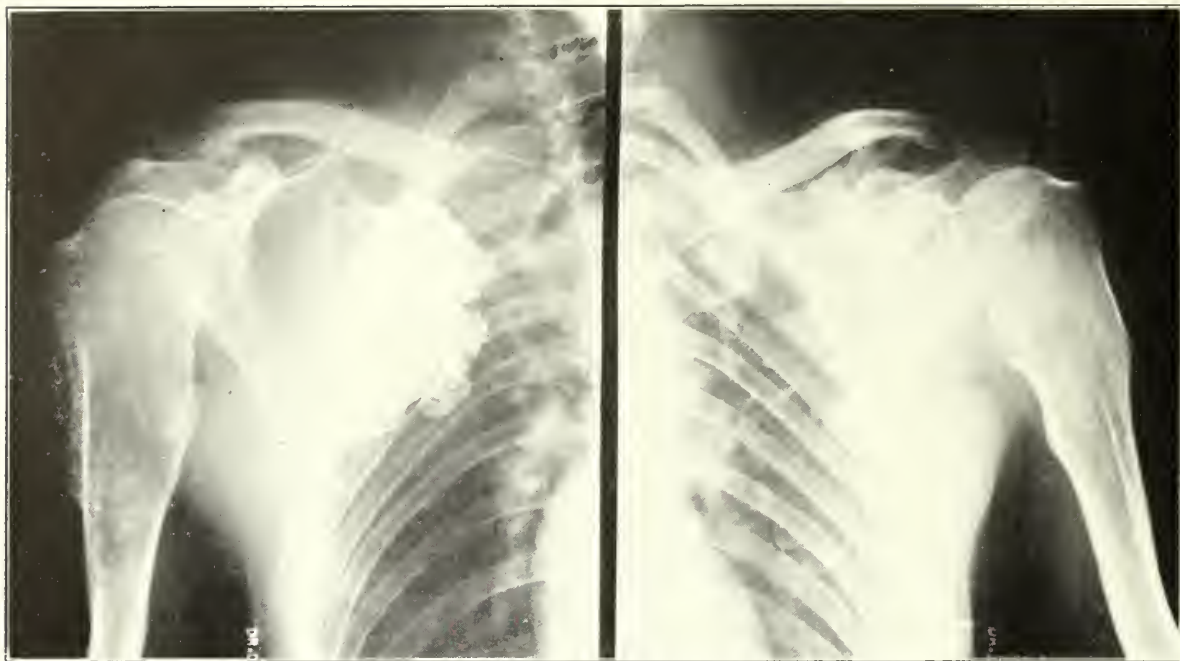


Fig. 1. A. The large nodular osteochondroma growing from the vertebral border of the right scapula and the spreading diaphysis of the humerus with thin cortex and several exostoses. B. Left humerus.

Figure 1A shows the large nodular osteochondroma growing from the vertebral border of the right scapula, also the spreading diaphysis of the humerus with thin cortex and several exostoses. Figure 1B shows the left humerus with characteristics described in that of figure 1, except for the chondroma.

Figure 2 shows the right and left knee joints, a third of each femur, with tibia and fibula showing. The wide diaphyses are seen as are the exostoses which are especially prominent on the femurs. In addition there is a synostosis between each fibular head and its tibia. The foam like appearance of the fibula suggesting cysts is caused by chondromata, another of which is seen on the upper medial aspect of the right tibia, and perhaps one in the right femur shaft.

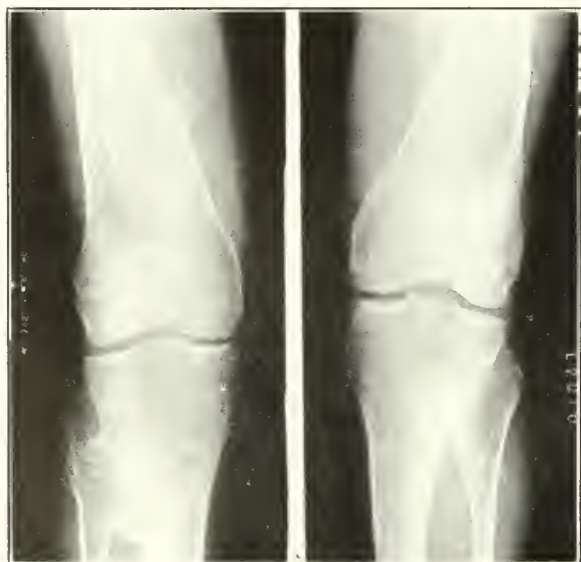


Fig. 2. Right and left knee joints.

Case 2. This man was referred by Dr. P. B. Nussbaum in 1935. He was 43 years old and had consulted the urologist for bladder symptoms. A neurogenic bladder was found. His history is incomplete owing to his refusal to return.

The man came in on crutches and certain characteristics immediately impressed one. He was short of stature, had short arms and he had a flaccid paralysis of the legs. He, his brother and a cousin stoutly denied that any other member of his family had any bone deformities. He had worked hard since his sixteenth year in a shoe factory, automobile wrecking shop and on the farm. He was aware of his short arms most of his life. In 1935 he noticed bladder symptoms as tenes-



Fig. 3. Right and left knee joints in case 2.





Fig. 4. Pelvis and upper one third of femurs in case 2.

mus. frequency and burning. Eventually there was intermittent retention and involuntary escape of urine. The flaccid paralysis accompanied this symptom group. His rectal sphincter was relaxed. Kahn test was negative.

On examining the few plates there are of this case, the usual characteristics are quite evident; namely, the widening of tibia and femur metaphyses right and left; the thin cortex of these bones in their upper and lower extremities respectively, the fibula being included; the synostosis between fibula and tibia in each leg, the exostoses from femurs, tibias and fibulas. Here too there is a slight lateral curvature of the tibia from the restraining influence of the probably short fibula.

Figure 4 presents the pelvis with the upper one third of each femur. Here again one sees the wide diaphysis and thin cortex in both femurs. In addition there is on the right side an exostosis with base at the femur neck, its inferior border apparently attached to the intertrochanteric line and extending downward and medially beyond the lesser trochanter, its tip being capped with cartilage. It is wide enough to encroach apparently considerably on the space between femur and ischium. The lesser trochanter itself presents a small exostosis with cap.



Fig. 5. Right and left forearms in case 2.



Fig. 6. Right and left forearms in case 2.

The pelvis is considerably deformed. There is a hiatus sacralis and an irregularly rounded osteochondroma in the ala of the right ilium. The vertebrae are involved as is shown by an irregular exostosis growing downward and laterally from the left transverse process of the fifth lumbar vertebra and fusing with the ilium. Another exostosis reaches upward from the same transverse process to unite it above. The right fourth transverse lumbar process sends a spur downward. While other causes for the flaccid paralysis have not been excluded, the somewhat inadequate history added to the fact that other authors report like cases, accounting for the symptoms as a consequence of cord pressures. This may justify the conclusion that cause and effect are before us.

In figures 5 and 6, showing the right and left forearms, the shortening of the ulna in each case with deformity and exostoses of the distal end and fusion of the two bones with their radial partners is apparent. In each case, too, the radius has been dislocated upward and radially. On the right side the radial head is missing and the narrowed extremity shows condensation of bone. Perhaps a nutrient vessel was damaged as a result of the dislocation with resulting atrophy. The soft tissues are dense about this radial extremity and appear to have formed an articular bed for it. The upper shaft presents medially a periosteal reaction. Each radius presents a widened diaphysis distally. The fifth metacarpal bone at its head and the fifth proximal phalanx at its base present a chondroma. On the left side the dislocated radius has retained its head. There is fusion in its lower third with the ulna which has several exostoses there and another on the anterior surface of its coracoid process.

Perhaps the mechanism of radial dislocation depends first on fusion between radius and undeveloped ulna in the lower aspect, and then on effort, more or less violent, of pronation.

Two cases of familial congenital chondrodysplasia are reported. They conform to the elucidating description of Geschickter and Copeland which has been quoted. A point of variance from the usual is that there is no family history in either case.\* Transitional phases of the disease process are shown in the associated chondromata, in scapula, pelvis, metacarpus and phalanx.

## BIBLIOGRAPHY

1. Hartmann, Franz: Handbuch der Allgemeinen Pathologie fuer Aerzte und Studierende, Erlangen, Verlag von Ferdinand, Enke, 1864.
2. Billroth, Theodor: Pathologie u Therapie in funfzig Vorlesungen, Zuerich, Aufl. Berlin, Verlag von George Reimer, 1866; ant Winniwarter, Alex: Aufl. Berlin, Verlag von George Reimer, 1893.

3. Ribbert, Hugo: *Lerhbuch d. Allgem., Path. and Path. Anot.*, Leipzig, Verlag V. F. C. W. Vogel, 1901.
4. Tillmanns, Hermann: *Principles of Surgery and Surgical Pathology*, New York, D. Appleton, 1895.
5. Alley, Reuben: *Hereditary Deforming Dysplasia, Radiology* (May) 1937.
6. Scott, Roland: *Chondrodysplasia: Hereditary Multiple Cartilaginous Exostoses, Report of Five Cases in a Negro Family*, *Am. J. Dis. Child.* 1075 (May) 1939.
7. Meyerding, Henry: *Exostoses, Radiology* 282 (April) 1927.
8. Brailsford, James E.: *Radiology of Bones and Joints*, Wm. Wood & Co., 1935, p. 412.
9. Beschickter, Charles F., and Copeland, Murray M.: *Tumors of Bone*, *Am. J. Cancer*, p. 645, 1936.

\* In discussing this paper, Dr. O. J. Miller stated that he had just learned of a sister of case 1 who recently discovered a "lump" on her shoulder.

## SPECIAL ARTICLE

### CANCER INCIDENCE AMONG LEAD WORKERS

BERTRAM J. BLACK, M.S.W.

ST. LOUIS

In view of the definite influence of the administration of lead in the destruction of the epithelial coverings of the embryo, Dr. Blair Bell, Liverpool, England, in 1924, conceived the idea that lead might be an effective agent in the destruction of the embryonal type of cell that constitutes cancer. There was some clinical and experimental work that corroborated these views but no definite conclusions could be drawn as to the therapeutic value of lead treatment in cancer. Some statistical studies were made at this time as to the incidence of cancer among lead workers.

Dr. Bell's analysis of data supplied him by the British Plumbers Union concluded that, among plumbers, there was a rise in the cancer death rate proportionate to the decrease in the number of deaths from plumbism.<sup>1</sup> He examined the mortality statistics for plumbism and cancer in England and Wales in the periods 1900 to 1902 and 1910 to 1912 and concluded again that a decrease in the number of deaths from plumbism is accompanied by an increase in the mortality from cancer in the occupations in which lead poisoning is most prevalent. Later examination of the British statistics indicated that Dr. Bell based his conclusions upon exceptionally scant data or else came to false conclusions from the material at hand. Dr. Mathew Young and W. T. Russell, of the Privy Council's Medical Research Council, presented in the Special Report Series for 1926 the following table of comparative mortality figures:

Young and Russell report as follows<sup>2</sup>: "Out of eight groups with a comparative mortality figure for lead poisoning above the standard for England and Wales in 1900-02, only two are markedly low for cancer while two are markedly high; in 1910-12 only one group, printers, is rather low, and only one, plumbers, is high. A few other groups with no cases of lead poisoning are also given in order to

Table 1. Comparative Mortality Figures

Occupational Groups	1910 1912		1900 1902	
	Cancer	Occupational Lead Poisoning	Cancer	Occupational Lead Poisoning
Lead Manufacturers	80	123	81	102
Potters	80	22	74	10
Plumbers, Painters	87	20	73	23
File-makers	78	10	57	56
Copper Manufacturers	71	6	45	3
Gunsmiths	78	4	74	
Printers	68	2	65	2
Glass Makers	81	2	71	8
Chemical Manufacturers	71		85	3
Occupied and Retired				
Males	78	1	68	1
Clergy	45		48	
Coal Miners	61		53	
Ship Builders	64		55	
Slaters, Tilers	117		71	
Furriers, Skinners	82		115	

show that lower and higher cancer figures, with more pronounced variations in rise or fall, are to be found in other occupations than the 'lead' occupations. These data do not reveal the connection suggested between cancer and lead poisoning."

An exhaustive search of the library files of the Metropolitan Life Insurance Company of New York, made for the writer through the courtesy of Dr. Louis I. Dublin and Mr. Robert J. Vane, Jr., yielded the following information: In 1925 a study was made by the Occupational Ratings Department under Mr. Vane's direction as to the incidence of cancer among workers in the lead industries. The letter reporting to Dr. Dublin, dated November 16, 1925, says: "The occupational mortality studies of Bertillon, the Registrar General of England and Wales, and our own proportionate mortality of 1911 to 1913 show that the principal lead occupations have average or slightly above average mortality rates from cancer."

In 1927 the research librarian of Dr. William Seaman Bainbridge of New York City asked the Metropolitan Life Insurance Company for a comparative study of incidence of cancer among lead, steel, copper, zinc and brass workers. The findings showed that rates are average for each with no significant differentials. At that time the suggestion was made that records of the St. Joseph Lead Company, Bonne Terre, Missouri, be studied separately. This was evidently done for Mr. Vane explained to me that the small figures involved were entirely without significance. He also questioned the possibility of finding a comparative control group at the time and total deaths and number of employees were too small to be standardized for comparisons.

These same objections to drawing conclusions from the lead company data hold today. However, an examination of the mortality records for two lead smelting plants in the Missouri lead belt area indicate that the cancer mortality for men working in these plants, where they are subject to contact with volatile lead, is relatively small. These findings, compared with cancer mortality among men employed in plants working with lead in an inert

<sup>1</sup> Statistical Research Assistant, Cancer Commission of the State of Missouri.



form, are interesting enough in their indications that I wish to present them.

*Herculaneum Smelting Plant, St. Joseph Lead Company*

Vital Statistics for 18 year period, September 1920 to September 1938, inclusive.

Total Deaths,	45	
Cancer Deaths,	2	Per cent of Total Deaths, 4.45
Cancer deaths: 1 man, aged 58 at time of death, 17 years service as a carpenter; 1 man, aged 63 at time of death, 8 years service as carpenter-bricklayer.		
Number of employees at present time, 229.		
Under age 20,	1	
Age 20-29, inclusive	40	
Age 30-39, inclusive	57	
Age 40-49, inclusive	60	
Age 50-59, inclusive	53	
Age 60-69, inclusive	18	

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Average Age: 42.75 years.

Average length of service, estimated 22 years.

Percentage turnover reported as 3 to 4 per cent.

*Federal Smelting Plant, American Smelting and Refining Co.*

Vital Statistics for 15 year period, 1923 to 1938, inclusive.

Total Deaths,	30	
Cancer Deaths,	1	Per cent of Total Deaths, 3.33
Average age of workers 38 years.		
Average length of service 8 years.		

*Plants Working With Inert Galena, St. Joseph Lead Company.*

Vital Statistics for 18 year period, September 1920 to September 1938.

Total Deaths,	417	
Cancer Deaths,	28	Per cent of Total Deaths, 6.7
Number of Employees estimated at 1500.		
Average age estimated at 40 years.		
Average length of service estimated at 22 years.		
Reported turnover, 3 to 4 per cent.		

It is significant that in both smelting plants the percentage of cancer deaths to total deaths is lower than in the plants working with lead in inert form. The difference, however, is not great. By pooling the data for both smelting plants, the percentage of cancer deaths of total deaths is 4 per cent. Two of the three cancer deaths in the smelting plants were of men who came in comparatively little contact with volatile lead, a carpenter and a bricklayer. One or two additional cancer deaths would materially change the picture.

Studies of the incidence of cancer among workers in industries allied to lead manufacturing give but inconclusive results. The latest report of the Registrar General of England and Wales, containing a chapter on cancer by occupations, shows no difference between cancer incidence among workers in lead industries (lead workers and manufacturers, file makers, printers, plumbers, painters, glaziers) and industries having no association with lead. In the Bureau of Labor Statistics Bulletin 507, "Causes of Death by Occupation," Dr. Dublin and Mr. Vane report cancer incidence to be average or above among printers, painters, paper hangers, varnishers, plumbers, gas fitters and steam fitters. Searching of the library files of the New York Academy of Medicine and of the statistical library of the Metropolitan Life Insurance Company (claimed by company officials to be the most complete library on vital, mortality and actuarial statistics in the world, containing material in many languages) and correspondence with the Bureau of the Census and the Bureau of Labor Statistics, have yielded no other data on the subject.

Dr. Alice Hamilton of the United States Department of Labor says, in a letter to me, "So far as we know lead has no influence on the production of cancer, either directly or indirectly, and I know of no study which has shown that lead workers have more than the normal proportion of cases of cancer." Conversations with Dr. Louis I. Dublin and Dr. A. J. Lanza (who has studied tuberculosis incidence among Missouri and Kansas lead workers) of the Metropolitan Life Insurance Company, and with Dr. Morton L. Levin of the staff of the New York Legislative Cancer Commission revealed that these authorities know of no studies of incidence of cancer among lead workers other than those previously mentioned.

The conclusion to be drawn from the foregoing discussion is that to date there is no available body of data which can be used to answer the question "Is there smaller incidence of cancer among workers exposed to lead poisoning or plumbism than among workers not so exposed?" I believe that of the material presented the study of the statistics of the two smelting plants in comparison with figures for workers with inert lead is most significant. If the total figures could be at least trebled, the element of chance in the resultant figures would be greatly reduced and the first body of material needed to answer the question which prompted this discussion would be at hand.

In conclusion, it should be noted that the procedures for adding to the present data are tedious and exceptionally expensive unless over a long period of years a list of cancer cases is collected in cooperation with the lead industry and control industrial groups.

3713 Washington Blvd.

#### BIBLIOGRAPHY

1. Bell, W. Blair: Some Aspects of the Cancer Problem, 1930, pp. 206-212.
2. Young, Mathew, and Russell, W. T., et al.: An Investigation into the Statistics of Cancer in Different Trades and Professions, Special Report Series No. 99, Privy Council, Medical Research Council of Great Britain, 1926, pp. 14-15.

#### SYNTHETIC FEMALE SEX HORMONE

Twenty-five girls, ranging in age from 20 months to 12 years, were successfully treated for a gonorrheal infection by the administration by mouth of a synthetic female hormone called diethylstilbestrol, Joseph D. Russ, M.D., and Conrad G. Collins, M.D., New Orleans, report in *The Journal of the American Medical Association* for June 22.

The condition is generally the result of accidental infection from contaminated materials and is common in young girls, especially under the age of 7 years. Its treatment has always been difficult.

In the cases reported by the New Orleans physicians negative smears were obtained in from seven to eighteen days. The substance was crushed and administered in two ounces of milk. The two physicians say that: "The rapidity of cure, the absence of any toxic or deleterious effects and the ease of administration as regards both the family and the physician lead us to believe that it is an ideal drug for the treatment of this condition." They also point out that it is an economical method of treatment.

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JULY, 1940

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## EDITORIALS

### THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.
2. The allotment of such funds as the Congress may make available to any state in actual need for the prevention of disease, the promotion of health and the care of the sick on proof of such need.
3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.
4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.
5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.
6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.
7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.
8. Expansion of public health and medical services consistent with the American system of democracy.

### NEW YORK SESSION OF THE AMERICAN MEDICAL ASSOCIATION

The great metropolis, New York City, was host to the American Medical Association June 10 to 14 on the occasion of its ninety-first Annual Session. Registered at the Session were 12,864 Fellows, the largest attendance in the history of the Association. The last meeting held in New York City was in 1917 and had an attendance of 5,147.

In the House of Delegates the Missouri State Medical Association was represented by Drs. A. R. McComas, Surgeon; James R. McVay, Kansas City; H. L. Kerr, Crane, and Robert E. Schlueter, St. Louis. Dr. J. Archer O'Reilly, St. Louis, was a delegate from the Section on Orthopedic Surgery and Dr. E. H. Skinner, Kansas City, was a delegate from the Section on Radiology. Dr. Alphonse McMahon, St. Louis, served in his capacity as Vice President. One hundred thirty-eight Fellows attended from Missouri.

San Francisco was chosen as the place of meeting in 1943. Invitations were extended by St. Louis, San Francisco and Detroit. On the first ballot Detroit was dropped from the list having received the lowest number of votes and neither of the other contenders received a majority of the votes cast. On the second ballot San Francisco received ninety votes and St. Louis fifty. Dr. Robert E. Schlueter, St. Louis, presented the invitation from St. Louis on behalf of the Missouri delegation. The sessions for 1941 and 1942 will be held in Cleveland and Atlantic City respectively.

Dr. James R. McVay, Kansas City, was appointed by the Speaker to serve as a member of the Reference Committee on Executive Session and Dr. E. H. Skinner, Kansas City, was appointed a member of the Reference Committee on Rules and Order of Business.

The resolution adopted by the House of Delegates of the Missouri State Medical Association at the Joplin Session requesting the establishment of a Committee on Conservation of Eyesight by the American Medical Association was introduced by Dr. James R. McVay, Kansas City, and was referred to the Reference Committee on Hygiene and Public Health. A substitute resolution was adopted. It was prepared and presented by the Section on Ophthalmology and petitioned the Board of Trustees to appoint a Committee on Conservation of Vision and Prevention of Blindness, the committee to consist of five members to be appointed from the Section on Ophthalmology.

The most important business of the House of Delegates was the adoption of a resolution presented by the Board of Trustees offering all the facilities of the American Medical Association to the service of national defense and the creation of a Committee on Medical Preparedness whose task will be to mobilize all the nation's vast medical resources into a nation-wide volunteer medical corps, working through the constituent state medical



associations and the component county medical societies. The Committee consists of ten members of the House of Delegates and five officers of the American Medical Association as *ex officio* members.

Dr. Irvin Abell, Louisville, Past President of the Association, was named chairman of the preparedness committee. The members are: Dr. Stanley H. Osborn, Hartford, Connecticut; Dr. Walter G. Phippen, Boston; Dr. Harvey B. Stone, Baltimore; Dr. James E. Paullin, Atlanta; Dr. Fred W. Rankin, Lexington, Kentucky; Dr. Roy W. Fouts, Omaha, Nebraska; Dr. Sam E. Thompson, Kerrville, Texas; Dr. Charles A. Dukes, Oakland, California, and Dr. John H. O'Shea, Spokane, Washington. The five *ex officio* members are: Dr. Nathan B. Van Etten, New York, President; Dr. Olin West, Chicago, Secretary; Dr. Arthur W. Booth, Elmira, New York, chairman of the Board of Trustees; Dr. Austin A. Hayden, Chicago, secretary of the Board of Trustees, and Dr. Morris Fishbein, Chicago, Editor.

Simultaneously with the presentation of the resolution by the Board of Trustees, Dr. George C. Dunham, delegate representing the United States Army, offered a comprehensive plan for mobilizing physicians and surgeons "in the event of a national emergency of great magnitude" similar to the medical mobilization program followed when the United States entered the World War. This was referred to the Committee on Medical Preparedness.

Dr. Abell said representatives of the Committee would confer immediately with the surgeons general of the Army, Navy and Public Health Service on the work to be undertaken for the purpose of setting the mobilization machinery in motion as quickly as possible. Dr. Abell told the House of Delegates that American physicians likely would adopt the method employed by the physicians in Canada where a card questionnaire was sent to all Canadian physicians asking the following questions: "Are you willing to give full time service abroad? Full time service in Canada? Full time service in your locality? Part time service in your locality?" More than 90 per cent of the members of the Canadian Medical Association offered their services in one of the four categories according to Dr. Abell. Dr. Abell in part said: "There never has been an emergency in this country but that the medical profession has made available its services and facilities to the government."

Dr. Nathan B. Van Etten, New York, in his address before the House of Delegates, said the American Medical Association has offered "all of its organization facilities to the federal government and stands ready to cooperate to the limit of its ability in all measures of national defense. . . . If we must enter a new war as combatants, we shall do so whole heartedly."

At the same time Dr. Van Etten warned against

a threatened "pagan" invasion not only with guns but with ideas that would force foreign systems of medical practice upon America's physicians. "Love of country," Dr. Van Etten said, "is a noble passion but loss of the strong position of organized medicine in the United States would be deplorable and in the midst of this excited moment we must not lose sight of our patriotic ideals for the health and happiness of our people. We must not lose sight of the dangers to medical practice through concentrations of federal authority. I believe that the medical profession should go along with the government as far as possible for the common good without sacrificing its individual interests in the care of the sick and its collective interests in the prevention of disease."

Dr. Rock Sleyster, Wauwatosa, Wisconsin, retiring President, called upon physicians to stand ready to offer their services to the nation as they did in the World War. He said: "Today our nation is again preparing to defend itself to the utmost against any type of aggression from without. Our medical profession, I know, through its House of Delegates, will pledge itself to give, as it has always given in the past, every iota of service that it is capable of rendering and I would call on this House of Delegates to prepare, in suitable form, an offer of this type to the federal government."

The Secretary, Dr. Olin West, Chicago, in his report to the House of Delegates, called attention to the wide diversities in membership classifications that have been established by component and constituent societies. A proposed amendment to the Constitution and By-Laws was introduced providing that only Doctors of Medicine licensed to practice medicine shall be eligible to membership. This amendment will lie on the table until the 1941 Cleveland Session.

In a resolution relating to the Wagner-George bill (S. 3230) providing for a \$10,000,000 construction program of small hospitals in various parts of the country, the House recommended that the hospitals be built only in communities where actual need can be shown and where local government units can demonstrate their ability and willingness to maintain the institutions when built. The House also voted that "the amendment providing for a possible osteopathic representation on the council (for the small hospitals) is entirely unwarranted and should be eliminated from the bill."

The House also urged that each state medical association create a special committee to act in an advisory capacity to state health departments on any hospital construction projects that may be contemplated under the pending legislation and that the special committee appointed by the House of Delegates last year be continued "so as to be on call by the President of the United States or other governmental authorities," and also that the Council on the Small Hospitals, provided for in the bill, be appointed by the President of the United States.

The Wagner-George bill was recently passed by the Senate and is now pending before the House of Representatives.

A resolution praising the Museum of Health at the World's Fair and encouraging constituent state associations to establish similar museums was adopted.

The report of the Committee on Reapportionment that each state association be allowed one delegate for each 930 members or fraction thereof was approved. Missouri will be represented by four delegates for the next three sessions.

The following were elected to Affiliate Fellowship: Dr. J. M. Russell, Monett; Dr. Herschel W. Lancaster, Nevada; Dr. Leroi Beck, St. Joseph; Dr. Hasbrouck DeLamater, St. Joseph; Dr. James Y. Simpson, Houston, Texas (member Jackson County Medical Society); Dr. J. H. Lanning, Kansas City.

Dr. Frank Howard Lahey, Boston, was elected President-Elect of the Association. Dr. Lahey is director of surgery at the Lahey Clinic, Boston. He was born in Haverhill, Massachusetts, June 1, 1880. He received his degree at Harvard Medical School in 1904 and received the honorary degree of Doctor of Science from Tufts College in 1927. He was instructor in surgery at Harvard Medical School in 1908 and 1909 and from 1912 to 1915 and was assistant professor and later professor of surgery at Tufts College Medical School from 1913 to 1917 and professor of clinical surgery in 1923 and 1924. He is surgeon in chief to the New England Deaconess and North East Baptist hospitals. Dr. Lahey served as a major in the Medical Corps, United States Army, during the war of 1914-1918 and was director of surgery in Evacuation Hospital 30, American Expeditionary Forces. He is a member of the American Surgical Association, International Society of Surgeons, board of governors of the American College of Surgeons and the American Association for the Study of Goiter of which he was president in 1936. He was president of the New England Surgical Society in 1931. He served on the Council on Scientific Assembly of the American Medical Association from 1927 to 1937 and was elected to the Council on Medical Education and Hospitals in 1938. He was secretary of the Section on General and Abdominal Surgery from 1926 to 1929 and was chairman in 1929-1930.

Other officers elected were: Vice President, Dr. Parke G. Smith, Cincinnati; Secretary, Dr. Olin West, Chicago; Treasurer, Dr. Herman L. Kretschmer, Chicago; Speaker of the House of Delegates, Dr. H. H. Shoulders, Nashville; Vice Speaker, Dr. Roy W. Fouts, Omaha; Board of Trustees, Dr. Ralph A. Fenton, Portland; Dr. James R. Bloss, Huntington, Virginia, and Dr. William F. Braasch, Rochester; Judicial Council, Dr. George Edward Follansbee, Cleveland; Council on Medical Education and Hospitals, Dr. John H. Musser, New Orleans, and Dr. Herman G. Weiskotten, Syracuse; Council on Scientific Assembly, Dr. A. A. Walker, Birmingham.

Dr. Chevalier Jackson, Philadelphia, received the third annual award of the Association for distinguished scientific work in medicine.

### LONGEVITY OF LIFE

The crude general death rate and the infant mortality rate for 1938 were the lowest ever recorded for the United States according to a summary of vital statistics for the United States for 1938 recently issued by the Bureau of the Census. The death rate was 10.6 per 1,000 population and the birth rate was 17.6, a net natural increase of 7.0 per 1,000 population, the largest since 1930. During the period from 1928 through 1938 the infant mortality rate declined from 68.7 to 51.0 and the maternal mortality rate declined from 6.9 to 4.4.

Based on the vital statistics of 1938, thirteen and one half years has been added to the average longevity of life since the beginning of this century. The expectation of life at birth of the general population in this country in 1901 was 49.24 years and by 1938 the figure had increased to 62.78, the increase amounting to 27½ per cent of the figure for 1901. The increase over 1937 was 1.3 years.

The improvement in average length of life since 1901 has been greater in the white population than in the population as a whole. During this period the expectation of life at birth among white males increased by 13.89 years and that of white females by 15.12 years.

Mortality rates, so closely connected with expectation of life statistics, show that all ages shared in the general improvement. The mortality rate in the first year of life in 1938 was two fifths of that in 1901; at ages 1 to 4 the 1938 rate was approximately one fifth; at age 20 the rate was two fifths; at age 35 approximately one half and at age 50 approximately three fourths of the rate in 1901.

### NEWS NOTES

Dr. R. L. Sutton, Jr., Kansas City, was a guest of the New Mexico Medical Society at Albuquerque on May 27 and spoke on "Dermatitis Venenata and Acne Vulgaris."

Dr. Owen W. Krueger, Kansas City, was a guest at a dinner on May 29 given at St. Margaret's Hospital, Kansas City, Kansas, in celebration of his fiftieth year in medical practice.

Dr. Dudley A. Robnett, Columbia, has been elected chief of the consultant staff of the Ellis Fischel State Cancer Hospital, Columbia. Other officers elected are Dr. Alphonse McMahon, St. Louis, vice chief of staff; Dr. E. Kip Robinson, Kansas City, secretary, and Dr. James R. McVay, Kansas City, and Dr. Louis H. Jorstad, St. Louis, members of the executive committee.



Dr. Hal Foster, Kansas City, received the first award of the Kansas City Society of O. O. R. L. in recognition of his organization of the American Academy of Ophthalmology and Otolaryngology and the Kansas City Society of O. O. R. L. The society decided recently to award a medal each year to one of its members in recognition of meritorious service to the society and the medical profession.

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Nonofficial Remedies:

McKesson & Robbins, Inc.

McKesson's Ascorbic Acid Tablets, 25 mg.

Shark Industries

Shark Liver Oil

Sharp & Dohme, Inc.

"Lyovac" Antivenin (Nearctic Crotalidae) Polyvalent

Smith, Kline & French Laboratories

Benzedrine Sulfate Ampules, 10 mg. 1 cc.

The Upjohn Company

Ampoules Sterile Solution Caffeine with Sodium Benzoate, 0.5 Gm. (7½ grains) 2 cc.

Hypodermic Tablets Caffeine with Sodium Benzoate, 0.065 Gm. (1 grain)

John Wyeth & Brother, Inc.

Thyroid Tablets

## ORGANIZATION ACTIVITIES

### SUPREME COURT DECIDES FOR TRIAL ON INDICTMENT OF AMERICAN MEDICAL ASSOCIATION

The *Journal of the American Medical Association*, issue of June 8, gives the following résumé of the status of the indictment of the American Medical Association under the Sherman Anti-Trust Act:

On December 20, 1938, an indictment was filed in the District Court of the United States for the District of Columbia charging the American Medical Association, Medical Society of the District of Columbia, Harris County (Texas) Medical Society, Washington Academy of Surgery and twenty-one individual defendants with conspiracy to violate section 3 of the Sherman Anti-Trust Act. The defendants filed a demurrer to the indictment. This means that the defendants contended that, even assuming everything alleged in the indictment to be true, there was no violation of the law as charged. Of course, on the issue thus formed the courts were bound to take as true, whether or not it was in fact true, each and every allegation of the indictment. The District Court agreed with the defendants' contention and on July 26, 1939, sustained the demurrer and dismissed the indictment.

From that order Thurman Arnold, as Assistant Attorney General, prosecuted an appeal to the Court of Appeals of the District of Columbia. While the case was pending in the Court of Appeals, and before a decision there, the government filed a petition in the

Supreme Court of the United States for a writ of certiorari to remove the case from the Court of Appeals to the Supreme Court of the United States. The defendants did not oppose this petition, but the Supreme Court denied it, probably on the theory that the issues presented were raised by demurrer and that the case had not been tried and the real facts did not appear in the record.

Thereafter the Court of Appeals proceeded to consider the case and on March 4, 1940, it reversed the order of the District Court and remanded the case to the District Court for trial. The Court of Appeals in its opinion said:

Defendants say that what they are charged with doing amounts to no more than the regulation of membership in the society and the selection of the persons with whom they wish to associate; that under their rules disobedient members may lawfully be disciplined, and that discipline does not amount to unreasonable restraint. This may very well be true, and in considering the contention we are not unmindful of the importance of rules of conduct in medical practice, rules which can best be made by the profession itself. We recognize, in common with an almost universal public opinion, that in the last half century, through this means, the quack and charlatan have been largely deprived of the opportunity of preying on the unfortunate and the credulous. We also recognize that in personal conduct and in professional skill the rules and canons, so established, have aided in raising the standards of medical practice to the advantage of the whole country. We are mindful of a generally known fact that under these rules and standards there has developed an *esprit de corps* largely as a result of which the members of the profession contribute a considerable portion of their time to the relief of the unfortunate and the destitute. All of which may well be acknowledged to their credit.

The court went on to say that, notwithstanding the foregoing, the defendants ought not restrain trade and that it thought under the allegations of the indictment the true facts should be brought out by a trial of the case, and that on a trial, if in fact restraint was shown, it would not necessarily violate the law if such a restraint was reasonable as a regulation of professional practice and that whether or not such restraint was reasonable as a regulation of professional practice must be shown in evidence on the trial of the case.

On April 29, 1940, the defendants filed in the Supreme Court of the United States their petition for a writ of certiorari to review the decision of the said Court of Appeals. The government opposed this petition and argued that the Supreme Court of the United States ought not decide the issues in this case on a demurrer to the indictment but ought to wait until the case had been tried and the real facts appear of record.

The Supreme Court apparently agreed with the government's contention in this regard, because on June 3 it denied the defendants' petition for a writ of certiorari. The Supreme Court of the United States did not decide the legal issues or any of them against the defendants but merely refused to review the decision of the Court of Appeals at this time and in effect said that the defendants would have to stand trial before it would pass on the issues.

The American Medical Association, its officers and the other defendants in this case feel certain that they have not violated the Sherman Anti-Trust Act and feel certain that they will be vindicated on a trial of this case, but they regret the expense that will necessarily be incurred in such a trial.

## DEATHS

Grady, Henry Douglas, M.D., Miami, graduate of the University of Missouri School of Medicine, Columbia, 1880, and the Bellevue Hospital Medical College, New York, 1881; honor member of the Saline County Medical Society; Affiliate Fellow of the American Medical Association; aged 83; died September 2, 1939.

**Conrad, Albert R., M.D.**, Caruthersville, graduate of Vanderbilt University School of Medicine, Nashville, 1889; member of the Pemiscot County Medical Society; aged 75; died February 2.

**Lott, George W., M.D.**, Westboro, graduate of the State University of Iowa College of Medicine, Iowa City, 1889; honor member of the Nodaway-Atchison-Gentry-Worth Counties Medical Society; aged 82; died February 10.

**Toner, T. Joseph, M.D.**, Wentzville, graduate of the Northwestern University Medical School, Chicago, 1906; member of the St. Charles County Medical Society; aged 66; died February 22.

**Liston, Elisha H., M.D.**, Nevada, graduate of the Illinois Medical College, Chicago, 1898; honor member of the Vernon-Cedar County Medical Society; aged 70; died March 29.

**Hays, Bernard W., M.D.**, Jackson, graduate of the University of Louisville School of Medicine, 1894; New York University College of Medicine, 1899; member of the Cape Girardeau County Medical Society; Fellow of the American Medical Association; President of the Missouri State Medical Association, 1938-1939; Councilor of the former 22nd District, 1935-1937; alternate delegate to the American Medical Association, 1936-1938; aged 73; died April 18.

**Ferguson, John P., M.D.**, Springfield, graduate of the Barnes Medical College, St. Louis, 1895; honor member of the Greene County Medical Society; aged 70; died May 7.

**Sneed, George F., M.D.**, Kirksville, graduate of St. Louis University School of Medicine, 1926; member of the Adair-Schuyler-Knox-Suyllivan-Putman Counties Medical Society; Fellow of the American Medical Association; aged 48; died May 10.

**Winn, William M., M.D.**, St. Louis, graduate of the National University of Arts and Sciences Medical Department, St. Louis, 1918; member of the St. Louis Medical Society; aged 47; died May 14.

**Coughlin, William T., M.D.**, St. Louis, graduate of Washington University School of Medicine, 1901; member of the St. Louis Medical Society; member American Board of Surgery; professor of surgery, St. Louis University School of Medicine, since 1911, and head of the department since 1920; aged 67; died May 22 of heart disease.

## BOOKS FOR LEISURE MOMENTS

### COLD NONSENSE

"Trapping the Common Cold" (Revell, New York) by Dr. George S. Foster is not likely to serve the useful purpose which the author claims for it. It may, on the other hand, produce a group of faddists who misguidedly insist upon a useless hygienic ritual. In so doing it will disappoint them for the little book is rife with physiologic fallacies, for example, that orange juice exerts some mystic magic in ordering the body economy. Personally I was gratified to learn that I may continue to smoke cigarettes in moderation without adding to my chances of contracting a common cold. Alcohol, as you may have guessed, is pernicious to the nth degree.

B. Y. G.

### RAE IOSDROM FIN U EDRON

"Doctor Hudson's Secret Journal" (Houghton Mifflin, Boston) is a powerful factual recital of the account of a mythical physician who added immeasurably to the technic of brain surgery, derived pleasure from rendering a peculiar type of personal guidance to his fellows and sought ceaselessly for his own spiritual comfort. He found solace only just before death.

Douglas (or Hudson or Merrick) offers no formulae

except as he follows the Golden Rule. Yet each reader will find his own formula if he is looking for one. Whatever nugget the individual reader extracts for himself, he will go on to the end held by the literary magic of a writer who uses grammatical structure as well as words to evoke feeling and to breathe vivid life into the situations and persons of which he treats.

B. Y. G.

### MASS HEALTH SUPERVISION

In 1930 Herbert Hoover reported to the White House Conference on Child Health and Protection that of the forty-five million school children in this country, a quarter suffered remediable physical defects, an estimate which most observers consider far too low. Dr. L. B. Chenoweth and Dr. T. K. Selkirk in the second edition of "School Health Problems" (Crofts, New York) describe the mechanics of rendering the necessary service to them. They have admirably delineated the whole and complex field of child health from the viewpoint of the school and the community. Perhaps they anticipate too much from endocrine therapy in the correction of physical defects and emotional maladjustments. Perhaps they are a little too fervid in a belief in the virtues of tonsillectomy, but they make a forceful case for the importance of implementing the work of the family physician through the school doctor. A wider appreciation of the latter's role both as it affects the child and as it affects the profession cannot fail to do good.

B. Y. G.

### WOMEN, THEN AND NOW

In old Germany the traditional method of recreation was through membership in a turnverein. Its stereotyped exercises provided a modicum of physical exhilaration as well as some pleasant social intercourse. That it was definitely harmful to the male members of the society is extremely doubtful. That it may have been harmful to the women is debatable.

Viewed from this background Stephan K. Westmann's "Sport, Physical Training and Womanhood" (Williams and Wilkins, Baltimore) becomes at least understandable to the American reader. Nevertheless the latter must doubt the author's thesis that sports make for a contracted pelvis and for prolonged and difficult labor. The statistical data brought to bear upon the point is as unconvincing as it is meager.

Westmann insists that women engage only in sports in which the call for physical energy follows a curve similar to that of the endometrium of the normal menstrual cycle. In other words, there should be a gradually ascending energy expenditure which never reaches a sharp peak but at its height follows a plateau, to fall off slowly again before the completion of the effort.

The last section of the book describes a variety of exercises designed to effect specified ends. Numerous illustrations clarify the textual explanation of maneuvers designed to strengthen body parts. They do more than any other section to make the volume desirable.

B. Y. G.

### MEDICINE MAN

Harold Aaron is medical consultant to the Consumers Union of the United States. His literary output is characterized by forthright exposition of thoroughly digested and widely accepted medical concepts in easily intelligible language. "Good Health and Bad Medicine" (McBride, New York) is concerned with the wealth of patent medicines and the dearth of accurate consumer information about them.

The medical profession should bring this book and others like it into the hands of the public else that public will go on spending four hundred million dollars every year on proprietary preparations.

B. Y. G.



## COUNCILOR DISTRICT AND SOCIETY PROCEEDINGS

### COUNTY SOCIETY HONOR ROLL FOR 1940

(UNDER THIS HEAD WE LIST SOCIETIES WHICH HAVE  
PAID DUES FOR ALL THEIR MEMBERS)

#### HONOR ROLL

Chariton County Medical Society, December 5, 1939.

Perry County Medical Society, December 11, 1939.

Camden County Medical Society, December 18, 1939.

Miller County Medical Society, December 20, 1939.

Ste. Genevieve County Medical Society, December 22, 1939.

Clinton County Medical Society, December 23, 1939.

Moniteau County Medical Society, January 8, 1940.

Macon County Medical Society, January 10, 1940.

Dent County Medical Society, January 29, 1940.

Dallas-Hickory-Polk County Medical Society, February 15, 1940.

Barry County Medical Society, February 22, 1940.

Audrain County Medical Society, March 22, 1940.

Webster County Medical Society, March 25, 1940.

Morgan County Medical Society, April 8, 1940.

DeKalb County Medical Society, April 15, 1940.

Newton County Medical Society, April 15, 1940.

ASSOCIATE EDITORS: COUNCILORS OF THE  
TEN COUNCILOR DISTRICTS

### MISSOURI STATE MEDICAL ASSOCIATION

Eighty-Third Annual Session  
Joplin

April 29, 30, May 1, 1940

### MINUTES OF THE HOUSE OF DELEGATES

Roof, Hotel Connor  
Monday, April 29, 1940

#### Morning Session

The first meeting of the House of Delegates of the Eighty-third Annual Session of the Missouri State Medical Association was called to order at 10:00 a. m. by the President, Dr. James R. McVay, Kansas City, on the Roof, Hotel Connor, Joplin.

The Committee on Credentials, composed of Drs. H. L. Langsdorf, St. Louis, Chairman; W. T. Stacy, St. Joseph, and C. A. W. Zimmermann, Cape Girardeau, reported a quorum present.

Officers, Councilors and Delegates who were present during the Annual Session follow:

#### Officers

President.....James R. McVay, Kansas City  
President-Elect...Cyrus E. Burford, St. Louis  
Treasurer.....R. L. Thompson, St. Louis  
(Delegate)  
Editor.....Walter Baumgarten, St. Louis  
Executive  
Secretary.....E. H. Bartelsmeyer, St. Louis

#### Councilors

1st District.....A. S. Bristow, Princeton  
3rd District.....Curtis H. Lohr, St. Louis  
4th District.....Robert B. Denny, Creve Coeur  
5th District.....W. A. Bloom, Fayette  
6th District.....A. J. Campbell, Sedalia  
7th District.....E. P. Heller, Kansas City  
8th District.....H. L. Kerr, Crane  
9th District.....Eldon C. Bohrer, West Plains

#### Delegates

Adair-Schuyler-  
Knox-Sullivan-  
Putnam.....J. S. Gashwiler, Novinger  
Adair-Schuyler-  
Knox-Sullivan-  
Putnam.....P. V. Hart, Coatesville  
Audrain.....J. F. Harrison, Mexico  
Barry.....G. W. Newman, Cassville  
Barton.....V. T. Bickel, Lamar  
Bates.....C. A. Lusk, Jr., Butler  
Boone.....M. Pinson Neal, Columbia  
Buchanan.....C. H. Werner, St. Joseph  
Buchanan.....W. T. Stacy, St. Joseph  
Buchanan.....J. I. Byrne, St. Joseph  
Butler.....J. Lee Harwell, Poplar Bluff  
Caldwell-  
Livingston.....G. S. Dowell, Braymer  
Callaway.....R. N. Crews, Fulton  
Cape Girardeau...C. A. W. Zimmermann,  
Cape Girardeau  
Camden.....George T. Myers, Macks Creek  
Carroll.....C. S. Austin, Carrollton  
Carter-Shannon...T. W. Cotton, Van Buren  
Cass.....D. S. Long, Harrisonville  
Chariton.....C. D. Stratton, Rothville  
Christian.....R. R. Farthing, Ozark  
Clinton.....L. F. Weyerick, Cameron  
Cole.....T. J. Kelly, Jefferson City  
Cooper.....A. C. H. Van Ravenswaay, Boonville  
Dent.....F. E. Butler, Salem  
Dunklin.....E. L. Spence, Kennett  
Franklin.....F. G. Mays, Washington  
Greene.....H. A. Lowe, Springfield  
Greene.....J. D. James, Springfield  
Grundy-Daviess...E. E. Nixon, Gallatin  
Harrison.....W. A. Broyles, Bethany  
Holt.....F. E. Hogan, Mound City  
Howard.....W. B. Kitchen, Glasgow  
Jackson.....John E. Castles, Kansas City  
Jackson.....Ralph E. Duncan, Kansas City  
Jackson.....Herbert L. Mantz, Kansas City  
Jackson.....E. Lee Miller, Kansas City  
Jackson.....Ralph R. Coffey, Kansas City  
Jackson.....Ralph R. Wilson, Kansas City  
Jackson.....Morris B. Simpson, Kansas City  
Jackson.....Ira H. Lockwood, Kansas City  
Jackson.....Andrew W. McAlester, Jr.,  
Kansas City  
Jackson.....George H. Thiele, Kansas City

Jackson..... Damon O. Walthall, Kansas City  
 Jackson..... Rexford L. Divcley, Kansas City  
 Jasper..... S. A. Grantham, Joplin  
 Jasper..... B. E. DeTar, Joplin  
 Johnson..... O. B. Hall, Warrnsburg  
 Lafayette..... J. S. Cope, Lexington  
 Lawrence-Stone... D. J. Silsby, Mt. Vernon  
 Linn..... J. R. Dixon, Linneus  
 Miller..... W. L. Allee, Eldon  
 Morgan..... J. L. Washburn, Versailles  
 Newton..... M. C. Bowman, Neosho  
 Nodaway-  
 Atchison-  
 Gentry-Worth... E. B. Settle, Rock Port  
 Nodaway-  
 Atchison-  
 Gentry-Worth... P. J. Ross, Grant City  
 Perry..... B. T. Koon, Perryville  
 Pettis..... C. D. Osborne, Sedalia  
 Phelps-Crawford.. R. E. Breuer, Newburg  
 Phelps-Crawford.. A. H. Horne, Steelville  
 Pulaski..... Cyrus Mallette, Crocker  
 Randolph-Monroe.. F. L. McCormick, Moberly  
 Ray..... I. E. Goldberg, Polo  
 St. Francois-  
 Iron-Madison-  
 Washington-  
 Reynolds..... E. F. Hoctor, Farmington  
 St. Francois-  
 Iron-Madison-  
 Washington-  
 Reynolds..... W. H. Barron, Fredericktown  
 St. Francois-  
 Iron-Madison-  
 Washington-  
 Reynolds..... J. P. Yeargain, Irondale  
 St. Louis County.. E. R. Brown, University City  
 St. Louis County.. O. W. Koch, St. Louis  
 St. Louis County.. O. P. Hampton, St. Louis  
 St. Louis County.. E. B. Waters, Kirkwood  
 St. Louis City.... Neil S. Moore, St. Louis  
 St. Louis City.... Paul F. Fletcher, St. Louis  
 St. Louis City.... R. L. Thompson, St. Louis  
 St. Louis City.... Robert E. Schlueter, St. Louis  
 St. Louis City.... W. E. Leighton, St. Louis  
 St. Louis City.... E. Lee Dorsett, St. Louis  
 St. Louis City.... James M. Macnish, St. Louis  
 St. Louis City.... John Hammond, St. Louis  
 St. Louis City.... Jerome I. Simon, St. Louis  
 St. Louis City.... Robert Mueller, St. Louis  
 St. Louis City.... Joseph C. Peden, St. Louis  
 St. Louis City.... R. Emmet Kane, St. Louis  
 St. Louis City.... Joseph A. Hardy, Jr., St. Louis  
 St. Louis City.... V. V. Wood, St. Louis  
 St. Louis City.... Philip S. Luedde, St. Louis  
 St. Louis City.... Louis Rassieur, St. Louis  
 St. Louis City.... Victor E. Sherman, St. Louis  
 St. Louis City.... Charles W. Miller, St. Louis  
 St. Louis City.... M. G. Seibel, St. Louis  
 St. Louis City.... Alphonse McMahon, St. Louis  
 St. Louis City.... Herbert S. Langsdorf, St. Louis  
 Saline..... R. W. Kennedy, Marshall  
 South Central—  
 Howell..... A. H. Thornburgh, West Plains  
 Texas..... L. C. Randall, Licking  
 Douglas..... R. M. Norman, Ava  
 Stoddard..... T. L. Waddle, Dexter  
 Taney..... G. B. Mitchell, Branson  
 Vernon-Cedar.... C. B. Davis, Walker  
 Vernon-Cedar.... J. W. Dawson, Eldorado Springs  
 Webster..... E. G. Beers, Seymour

On motion of Dr. E. P. Heller, Kansas City, the reading of the minutes of the previous meeting was dispensed with and adopted as printed in *THE JOURNAL*.

Dr. Herbert L. Mantz, Kansas City, nominated Dr. E. L. Spence, Kennett, as Speaker of the House.

Dr. J. F. Harrison, Mexico, nominated Dr. M. Pinson Neal, Columbia, as Speaker of the House.

On ballot, Dr. M. Pinson Neal, Columbia, was elected Speaker of the House and Dr. E. L. Spence, Kennett, was elected Vice Speaker by acclamation.

The President, Dr. James R. McVay, Kansas City, read his message and recommendations as follow:

## PRESIDENT'S MESSAGE AND RECOMMENDATIONS

It is my pleasure to greet you on this the 83rd Annual Meeting of the Missouri State Medical Association. I am sure you have watched, with the same pleasure that I have, the increasing interest of the whole medical profession in the problems of their organization. It is to be hoped that this interest will bear fruit in this session of the House of Delegates in the formulation and synthesis of a program for our organization for the next year which will have the unqualified and understanding support of the entire membership.

I hope that each and every one of you will give thorough and intelligent consideration to all of the proposals developed in the sessions of our deliberative body. Every delegate who has a constructive suggestion should offer it and he should be heard. Here democracy must reign supreme. Let us banish forever the expression, "What these fellows believe should be done," and replace it by the expression, "What we, the members, believe should be done."

A thorough study of the report of officers and committees, I am sure, has been made by each of you. May I take this opportunity of emphasizing certain of the recommendations contained in these reports?

Reference to the status of membership reveals that there has been an increase of but one member during the year. Regardless of a number of explanations for this condition, I do not feel that we can be satisfied with this situation. I recommend your earnest consideration of means and methods to bring every eligible physician of the State of Missouri into active membership in this organization.

THE JOURNAL has greatly improved in the last year both in the type of articles and the general make-up. This has been due to the careful work of the Committee on Publication under the chairmanship of Dr. Baumgarten, and to the excellent activities of the secretary, Mr. Bartelsmeyer. I bespeak for them the increasing interest of the membership to the end that our JOURNAL will reach a position of unexcelled superiority from both a scientific and revenue standpoint.

The Committee on Scientific Work has made an excellent contribution of the scientific program, scientific and technical exhibits. It is my hope that your interest in their work will be shown by your attendance at the meetings and your visits to the exhibits both scientific and technical.

The recommendation of the Committee on Postgraduate Course in regard to the Councilor District meetings, I think is an excellent one and I hope that it will be carried out.

Our attention at this time is naturally focused upon the Committee on Cancer. The relations between the organization and the State Cancer Commission have been understanding and amicable. I am sure that we shall make every effort to keep them so.

The report of the Committee on Industrial Health serves to emphasize the increasing importance of this Committee and I would recommend that this Committee be made a standing committee under the same regulations as the other standing committees.

The increasing interest in national preparedness brings forth a recommendation that our Association should have a special committee of five members to be known as the Committee on Medical Military Affairs with proper representation of the Army and the Navy.



The time has arrived in my opinion when we should make more adequate provision for a retirement fund for our employees. I should like to see the Council authorized to consummate a plan and report back to the House of Delegates.

I feel that you have accomplished several desirable objectives in the last few years and in order that upon these accomplishments a more comprehensive program may be built, I recommend your earnest consideration of holding your annual meetings only in those cities large enough to accommodate all of the requirements of such a meeting both as to meeting place and particularly as to space for scientific and technical exhibits.

With these words, may I wish for you a most successful, enlightening and progressive session of the House of Delegates.

On motion, duly seconded, the message was referred to the Council.

The President appointed the following reference committees:

Reference Committee on Amendments to  
Constitution and By-Laws

C. A. W. Zimmermann, Cape Girardeau, Chairman.  
J. D. James, Springfield.  
B. E. DeTar, Joplin.

Reference Committee on Resolutions

R. Emmet Kane, St. Louis, Chairman.  
W. T. Stacy, St. Joseph.  
Rex. L. Diveley, Kansas City.

Reference Committee on Miscellaneous Affairs

Morris B. Simpson, Kansas City, Chairman.  
E. F. Hoctor, Farmington.  
O. W. Koch, St. Louis.

Reference Committee on Medical Education  
and Public Welfare

V. V. Wood, St. Louis, Chairman.  
J. C. Peden, St. Louis.  
Ira H. Lockwood, Kansas City.

Dr. H. L. Kerr, Crane, Chairman of the General Committee on Arrangements, reported as follows:

REPORT OF THE GENERAL COMMITTEE  
ON ARRANGEMENTS

I assure you that this report, as of today, is entirely different from the one I would have given yesterday. Some of the members asked me what I was going to say and they said I would have to change it a lot or the Speaker would call me down hard. I wanted so much to say that you are now down in the land of the big red apple, the land of a million smiles. I would like to apprise you that you are attending the 83rd Annual Session, the biggest and best meeting we have ever had. Then I wanted to say that I thought if you looked around you might find some evidence of civilization, even some evidence of a medical profession in this typical western city. But I had to delete all that and I beg to report as follows: The work is done and here is your meeting. I thank you very much.

On motion, duly seconded, the report was accepted.

Dr. Paul W. Walker, Joplin, Chairman of the Local Committee on Arrangements, reported as follows:

REPORT OF THE LOCAL COMMITTEE  
ON ARRANGEMENTS

The Jasper County Medical Society is happy to have you here and wants you to have a good time, and possibly learn something. Our part in this program con-

sists mostly of the entertainment tomorrow night and we hope you will be with us.

On motion, duly seconded, the report was accepted.

The report of the Executive Secretary follows:

EXECUTIVE SECRETARY'S REPORT

The personnel of the headquarters office has cooperated with and carried out the instructions of the officers of the Association during the year and much of its work is represented by the reports of the various committees, the Council and the officers. A special effort was made to keep the county societies fully informed on the activities of the Association by the issuance of bulletins from time to time, correspondence and through the columns of THE JOURNAL.

In 1939 there was a gain of one member. In 1938 there was a gain of thirty-eight members.

Status of Membership

Number of members, Jan. 1, 1939 .....		3,290
New Members .....	138	
Reinstated .....	23	161
Total .....		3,451
Dropped .....	61	
Deceased .....	70	
Transferred .....	29	160
Total, Jan. 1, 1940 .....		3,291

Of this total 262 are Honor Members.

The President was called upon to appoint a member to the Committee on Cancer to fill the unexpired term (1940) of Dr. Titus S. Lapp, Fulton, resigned. The President appointed Dr. F. G. Thompson, St. Joseph, as a member of the Committee on Cancer. The President appointed Drs. G. J. Tygett, Cape Girardeau; C. R. Bruner, Columbia, and C. Souter Smith, Springfield, as Associate Members of the Committee on Conservation of Eyesight.

The Nominating Committee must submit nominations for the following offices:

Three Vice Presidents to fill the vacancies created by the expiration of the terms of Drs. E. S. Smith, Kirksville; Guy D. Callaway, Springfield, and J. E. Baird, Excelsior Springs. Two delegates and corresponding alternates to the American Medical Association. The members whose terms expire this year are Drs. A. R. McComas, Surgeon, alternate, Frank R. Teachenor, Kansas City; H. L. Kerr, Crane, alternate, W. F. Francka, Hannibal.

Honor members eligible for Affiliate Fellowship in the American Medical Association will be reported to the Council for recommendation to the House of Delegates.

The Council voted to join the St. Louis Medical Society in extending an invitation to the American Medical Association to hold its 1943 Session in St. Louis.

Article V, Section 2 of the Constitution, as amended at the Excelsior Springs Session, 1939, provides for the election by the delegates of a Speaker and Vice Speaker from their body. This order of business has been provided for immediately following the reading and approval of the minutes of the 1939 Session.

The terms (2 years) of the Councilors of the odd numbered districts expire this year, viz: Drs. A. S. Bristow, Princeton, First District; Curtis H. Lohr, St. Louis, Third District; William A. Bloom, Fayette, Fifth District; E. P. Heller, Kansas City, Seventh District; Eldon C. Bohrer, West Plains, Ninth District. Article IX, Section 2 of the Constitution provides: "The delegates present from each Councilor District shall meet on the morning of the third day of the Annual Session and elect the Councilor from that District." The following definite method of procedure was adopted by the House of Delegates at the 1939 Session:

At the close of the session on the first day the Secretary shall prepare lists of the delegates registered from the various councilor districts in which vacancies are to be filled, which shall be posted in the assembly hall and a copy given to the councilors whose terms expire.

The councilors in collaboration with the delegates shall determine upon the time and place of the meeting to be held on the morning of the third day of the Annual Session. The Secretary after being notified of such meeting shall cause a notice of the meeting to be posted in the assembly hall and make an announcement of the meeting in the House of Delegates or scientific assembly. The councilor shall act as temporary chairman of the meeting of the delegates from each respective councilor district. In the event a councilor is absent the President shall designate a delegate to perform these duties. The first order of business shall be to elect from among the delegates a permanent chairman and a secretary after which the councilor shall retire from this meeting. The chairman shall state the meeting is called for the purpose of electing a councilor to serve for a period of two years and that each candidate must reside or practice in the district. Nominations shall be received from the floor. The election shall be by secret ballot and a majority of the votes cast shall be necessary to elect. In case no nominee receives a majority on the first ballot, the nominee receiving the lowest number of votes shall be dropped and a new ballot taken. This procedure shall be continued until one of the nominees receives a majority of all the votes cast when he shall be declared elected. The election shall be certified to the House of Delegates by the chairman and secretary on a form to be prescribed.

If no election has been certified from a councilor district the incumbent shall serve until the next Annual Session.

In the event a delegate or his authorized alternate has not registered at the Session in time to be included on the list prepared and posted by the Secretary, he may attend the meeting on the morning of the third day of the Session and cast his vote for the election of a councilor, provided he has registered at the Session and his delegate's credentials bear the approval of the Committee on Credentials, and be it

*Resolved*, That this resolution meets with the approval of the Council and is respectfully submitted to the House of Delegates at the 1939 Annual Session.

To the Secretary of the Missouri State Medical Association:

This is to certify that at a meeting of the ..... Councilor District held on ..... at ..... a. m. .... of ..... was duly elected Councilor for a period of two years in accordance with Section 2, Article IX, of the Constitution with the resolution adopted by the House of Delegates outlining the method of election. .... delegates were present.

.....Chairman  
.....Secretary  
.....Mo., Date.....

In the official program the Committee on Scientific Work as a reminder has designated under "Time and Place of Meetings" the election of Councilors by the delegates at 8 a. m., Wednesday, May 1, 1940, having in mind that the general session begins promptly at 8:30 a. m.

THE JOURNAL continues to progress. The change in the design of the front cover has elicited many favorable comments from the members. Because of the favorable reception, special emphasis continues to be laid upon special subjects as "Topic of the Month" which was inaugurated December 1938. Constantly in mind is the improvement of THE JOURNAL itself as well as the securing of additional advertising. Additional advertising will reflect continued improvement, thus enabling THE JOURNAL gradually to enlarge its usefulness. Our members can assist materially by becoming JOURNAL-minded as never before. They can assist greatly in supporting THE JOURNAL by writing whenever possible for samples, making use of a coupon or the information offered by the advertiser, always mentioning THE JOURNAL in the request. Reader interest assures advertising income.

Immediately following the 1939 Session the Committee on Scientific Work began preparing the 1940 program. Ten out of state physicians of national renown in the field of medicine and surgery are our guests. Members will complete a well rounded scientific program, one which should appeal to every member of our Association. Round table luncheons are to be held on Tuesday and Wednesday of the Session. On Monday noon the Committee on Maternal Welfare and Infant Care will hold its annual meeting. On Monday evening the Association will tender its Past Presidents a dinner

to which the members of the House, presidents and secretaries of county medical societies, the members of the Association and their ladies and the Woman's Auxiliary are invited. Dr. Nathan B. Van Etten, New York, President-Elect of the American Medical Association, will address this meeting on the topic "An American Health Program." A round table discussion of problems in the practice of medicine will follow.

Twenty-one firms have accepted our invitation to exhibit their products at this Session, the maximum number our facilities could accommodate. Your welcome extended to the representatives of these firms will in a large measure determine their attendance in 1941. Be sure to call at each booth during the Session.

A number of our members have, at no little expense to themselves, erected scientific exhibits. Your examination of these exhibits will be of value to you and will encourage others to apply next year.

It is imperative that each county medical society be represented in the House of Delegates at the 1940 Session. It is equally important that the officers and committeemen of all the county societies attend. Events transpiring in the Federal Congress are of momentous political import as they tend to influence future medical practice and hospital service. Again we may reasonably expect the introduction of numerous bills at the forthcoming session of the 1941 general assembly of Missouri which will be inimical to the rendering of good medical and hospital service. The Annual Session of the Association provides the opportunity of unifying our resources in the defense of the best health interests of our state and nation. The action of the House of Delegates will establish policies of our Association for the guidance of its officers. It is earnestly requested that each delegate read carefully the reports of officers and committees so that each may present his opinion when the House of Delegates of our Association meets on April 29.

In grateful acknowledgment of the personal cooperation of county society secretaries, the Council has authorized that the secretaries will be guests of the Association at the dinner meeting to be held Monday night in honor of Past Presidents. Secretaries of all county medical societies, as well as all members, are urged to consider the headquarters office as their office, the facilities of which at all times are available for rendering service to the societies and members.

The Executive Secretary desires to express his grateful appreciation of the helpful advice and kindly assistance extended to him by the officers of the Association, the Editor, the individual councilors, members of the committees, the presidents and secretaries of the component county societies and the members of the Association. He also desires to acknowledge his gratitude for the efficient services of those immediately associated with him in the work of the secretary's office whose loyalty and aid have made many seemingly impossible tasks not only possible but enjoyable. And finally, he sincerely appreciates the whole hearted cooperation and assistance of the committees and members of the Jasper County Medical Society, our hosts, to whom full credit for the arrangements made for your comfort and enjoyment should be given.

E. H. BARTELSMEYER.

The report was referred to the Council.

The report of the Treasurer follows:

#### REPORT OF THE TREASURER

The financial status of the Association as of December 31, 1939, was published in detail in the April 1940 issue of THE JOURNAL. I have brought down the figures of receipts and expenditures since the first of January 1940, to and including March 31, 1940. These figures show the sums in the various funds as follows:



## General Fund

## RECEIPTS

Balance, Dec. 31, 1939 . . .	\$ 3,358.49
Membership dues collected	12,892.00
Annual Session Exhibit	
space . . . . .	250.00
Office Rent—subtenant . . .	135.00
Subscriptions—non-	
members . . . . .	23.65
JOURNAL advertising space.	1,903.37
Expense refunds . . . . .	5.01

Total . . . . . \$18,567.52

## DISBURSEMENTS

Vouchers paid . . . . .	\$ 7,247.24
Transferred to Public	
Relations Fund . . . . .	1,655.00
Total . . . . .	\$ 8,902.24
Balance, March 31, 1940 . .	\$9,665.28

## Public Relations Fund

## RECEIPTS

Balance, Dec. 31, 1939 . . .	\$ 1,503.74
Transferred from General	
Fund . . . . .	1,655.00

Balance, March 31, 1940 . . \$3,158.74

## Defense Fund

Balance, Dec. 31, 1939 . . . \$ 1,116.01

Balance, March 31, 1940 . . \$1,116.01

## Sinking Fund

Balance, Dec. 31, 1939 . . . \$ 4,269.00

Balance, March 31, 1940 . . \$4,269.00

These figures show that there was a balance of \$10,247.24 on hand January 1, 1940, and receipts from membership dues, advertising and other sources of income amounted to \$15,209.03. During the period January 1 to March 31, 1940, there was disbursed by vouchers, properly endorsed and signed by the officers, \$7,135.13. This leaves the financial status at March 31, 1940, as follows:

General Fund . . . . .	\$ 9,665.28
Public Relations Fund . . . . .	3,158.74
Defense Fund . . . . .	1,116.01
Sinking Fund . . . . .	4,269.00

Total . . . . . \$18,209.03

R. L. THOMPSON, Treasurer.

The report was referred to the Council.

The report of the Committee on Scientific Work, Dr. James E. Stowers, Kansas City, Chairman, follows:

REPORT OF THE COMMITTEE ON  
SCIENTIFIC WORK

The Committee on Scientific Work reports the annual program for your 1940 meeting at Joplin to be one of the most outstanding and attractive programs of recent years. Eight guest speakers have accepted our hospitality for the meeting and most of them on the program have consented to appear twice. In addition, this program is honored by contributions from sixteen of our outstanding members.

The committee greatly appreciates the cooperation of the officers and Council in assisting in making this program possible.

JAMES E. STOWERS, Chairman,  
RALPH A. KINSELLA,  
F. E. WALTON.

On motion, duly second, the report was accepted.

The report of the Committee on Postgraduate Course, Dr. C. H. Neilson, St. Louis, Chairman, follows:

REPORT OF THE COMMITTEE ON  
POSTGRADUATE COURSE

The Committee on Postgraduate Course and the Postgraduate Correlating Committee have been active and considerable progress has been made in giving instruction to physicians over the greater part of the state. Of course, we realize that our work is not as yet perfect but we still have an enthusiasm which we hope to instill into the county and district societies. The attendance at the various meetings which have been held has been good but the numbers of physicians attending these meetings is by no means what it should be. We are attempting to give something worth while but there is a certain amount of inertia among physicians, perhaps due to their work and distances from the centers of instruction, which prohibits them from attending meetings.

In the last year we have sent eighty-seven speakers to various parts of the state and they have addressed fifty-four meetings of twenty-four county and district societies, representing forty-six counties. Four councilor districts have held meetings at which twenty-four speakers appeared. These meetings reached the men in fifty-four societies.

THE JOURNAL, since the last Annual Session, has published symposia on the following topics: Mental Health, Conservation of Eyesight, Pulmonary Tuberculosis, Barbituric Acid, Crippling Diseases of Childhood, Vitamins, Maternal Welfare and Heart Disease. These symposia have been prepared by chairmen of the various committees of the State organization and the programs have been excellent and we believe that they have accomplished a great deal. The use of these topics for discussion by the county societies has not developed as we had hoped. It was thought that these topics of the month with the suggestion that they be the topic for discussion would appeal to the county societies. There may have been more of these county correlations than we know as many of the county societies have their sessions and we receive no report on their activities.

The following suggestions for the next year's work are made with the hope that they will meet with the approval of the House of Delegates and the Council:

1. Counties should have their regular meetings, discuss the topic of the month in THE JOURNAL and a report of the meetings with the attendance would be greatly appreciated by the Postgraduate Committee.

2. We recommend a continuation of the present efforts in regard to developing symposia on important subjects which are to be published in THE JOURNAL. Each of these symposia which has been prepared is along the lines of present thinking in medical practice and medical education and we feel that it would be valuable to continue this line of endeavor.

3. We also recommend and hope to bring to fruition councilor district meetings of one or two days including set papers, symposia and clinics. These should be held in centers large enough to accommodate the crowd and in centers which have hospitals where patients can be brought for the demonstrations and clinics. This, however, will take some money and we feel that our finances are not sufficient to carry on to its fullest extent and we hope to interest the State Board of Health and see if they cannot aid us in financing such meetings.

We wish to extend our felicitations to the Missouri State Medical Association in its efforts to aid the State of Missouri in postgraduate instruction. We wish also to give our praises to the efforts of the Councilor Districts in attempting to instruct their clientele in medical matters. Some councilor districts have held important meetings which have been well attended. Physicians of reputation and men who are not physicians have

been invited to these meetings to discuss problems of the day. We feel that this is what we have in mind for these councilor district meetings and we suggest to the House of Delegates and the Council that they give some thought to this line of attack to aid in the postgraduate education of the physicians in Missouri.

We wish to thank the President of the Missouri State Medical Association and also give our grateful thanks to Mr. Bartelsmeyer for his interest and efforts in our behalf.

C. H. NEILSON, Chairman,  
M. PINSON NEAL,  
W. ROGER MOORE,  
REXFORD L. DIVELEY,  
RALPH E. DUNCAN.

On motion, duly seconded, the report was accepted.

The report of the Committee on Publication, Dr. Walter Baumgarten, St. Louis, Chairman, follows:

### REPORT OF THE COMMITTEE ON PUBLICATION

January 1, 1939, to January 1, 1940

The 36th volume of THE JOURNAL was completed with the December issue. During 1939 there were published in THE JOURNAL one hundred six original articles, four special articles, forty-one editorials, one hundred seven news items, thirty-six obituaries, eighty-six society proceedings, seven Councilors' reports, eight Woman's Auxiliary reports, four miscellaneous articles, one correspondence, sixty-one book reviews, twenty-six books for leisure moments, twenty-three commercial announcements, thirty-six organization activity articles and three articles from the State Board of Health. There were 514 pages of reading material and 368 advertising pages. There were eighty-three books received for review in THE JOURNAL and were distributed to medical libraries in the state. Twenty-six books were received for books for leisure moments.

Advertising in THE JOURNAL from January 1, 1939, to January 1, 1940, earned \$8,449.19, with \$2,049.93 to be collected, totaling \$10,449.12. Subscriptions of non-members amounted to \$34.90, making \$10,534.02 actually earned by THE JOURNAL. The cost of production of THE JOURNAL (printing and illustrations) was \$7,085.40.

The Committee deeply appreciates the efforts of Mr. E. H. Bartelsmeyer, the Executive Secretary, and his staff, on whom the whole burden of the conduct of THE JOURNAL has fallen.

WALTER BAUMGARTEN, Chairman,  
BUFORD G. HAMILTON,  
M. H. SHELBY,  
C. T. RYLAND.

On motion, duly seconded, the report was accepted.

The report of the Committee on Public Policy, Dr. Morris B. Simpson, Kansas City, Chairman, was referred to the Reference Committee on Miscellaneous Affairs.

The Report of the Committee on Defense, Dr. C. E. Hyndman, St. Louis, Chairman, follows:

### REPORT OF THE COMMITTEE ON DEFENSE

March 15, 1939, to April 1, 1940

#### Status of Cases

Cases pending March 15, 1939.....	12
Threats pending March 15, 1939.....	1
New cases (March 15, 1939, to April 1, 1940).....	7
New threats (March 15, 1939, to April 1, 1940).....	1
Cases settled during year.....	14
Threats dropped during year.....	1
Cases pending April 1, 1940.....	6
Threats pending April 1, 1940.....	0

The disposition of the fourteen cases settled during the year was: two were thrown out of court; two were dropped; one was settled on payment of a nuisance fee; two were dismissed; three were verdicts for the defendants; two were settled out of court; one demurrer was sustained and suit withdrawn; on death of defendant no case was filed against the estate. The Association paid \$104.75 toward expenses in one case.

CHARLES E. HYNDMAN, Chairman,  
O. B. ZEINERT,  
L. P. FORGRAVE,  
M. L. KLINEFELTER,  
M. J. OWENS.

On motion, duly seconded, the report was accepted.

The report of the Committee on Cancer, Dr. Dudley A. Robnett, Columbia, Chairman, follows:

### REPORT OF THE COMMITTEE ON CANCER

The Committee has cooperated with the Missouri State Cancer Commission and has met with the Commission and discussed details as to the management and personnel of the State Cancer Hospital on each occasion that the Commission has requested such a meeting. In addition, the Chairman and other members of the Committee have attended joint meetings of the Council and the Commission where there was a discussion of the treatment of nonindigent or noncancer patients in the State Cancer Hospital.

The Commission and the Staff of the Cancer Hospital are confining the work at the hospital to indigent patients and making every effort to exclude all except cancer patients. Some patients with suspicious signs and symptoms, in whom only special diagnostic procedures or exploratory operations can exclude cancer, must necessarily be taken care of.

The Committee, as well as the Council, has urged that each county society appoint a cancer committee to cooperate with the county court to see that only indigent patients are certified to the hospital and only patients in whom there is a reasonable diagnosis of cancer.

The Committee feels that each society with an active committee on cancer should take an active interest in the indigent cancer problem and, where it is feasible, petition the Cancer Commission for the establishment of a diagnostic clinic.

Cancer programs in the medical societies have been less prominent this year than in the past but, when requested, the Committee has cooperated with the individual county societies.

Lay education has gone forward under the Missouri State Committee of the American Society for the Control of Cancer and the Women's Field Army. These organizations are playing an important role in the cancer program and have cooperated fully with this Committee. They deserve the support of the Association and the county societies.

DUDLEY A. ROBNETT, Chairman,  
EDWIN C. ERNST,  
WILLIAM E. LEIGHTON,  
ERNEST KIP ROBINSON,  
FREDERICK GREGG THOMPSON.

Dr. Robnett, Chairman, reporting further, said: The opening of the new Ellis Fischel Cancer Hospital brings the subject of cancer to the forefront. A lot of things have been ironed out in the last two years and the program is running smoothly. There has been cooperation between the Association and the Cancer Commission and it is important that that cooperation be continued. The Association must assume responsibility of this work and the county cancer committees must take care of the problem in their own counties if the matter is worked out as we hope it will be. I wish to ask the Speaker of the House for the privilege of introducing



Dr. Theodore D. Eberhard, Columbia, Medical Director of the State Cancer Hospital.

On motion, duly seconded, Dr. Eberhard was introduced:

DR. THEODORE D. EBERHARD, Columbia: I wish to express my deep appreciation of the privilege which you have extended in allowing me to address this organization. I am relatively a newcomer to the state and the Association but I know the large part the Association played in the inauguration of the cancer control program in Missouri, the care with which you have watched its growth and the aid which you have rendered in its development.

The Ellis Fischel State Cancer Hospital was formally dedicated April 26 and will receive its first patients May 1. The hospital has attracted wide-spread attention and has, for the time being, usurped the center of the stage. Actually, it is but a small part of the drama of cancer control and really only an expansion of the work which was started by the Association in 1933 by the establishment of a Committee on Cancer and approval of an ambulatory patient clinic at the State Hospital at Fulton.

The Cancer Commission, the staff members and I believe that the hospital first of all must never become an isolated institution existing by itself but must remain an integral part of the larger program. Primarily, the hospital must provide treatment for the medically indigent cancer sufferers of the state for whom the law established it. If it does that job well, its facilities will be taxed to the limit.

Furthermore, we believe in the preservation of the private practice of medicine and you have my word of honor that no patient without proper certification by a physician as well as the county court will be treated in that hospital. In addition, we are making an economic investigation of our own on every patient. Actually, in the last seven months at Fulton, we have found only two cases that were not obviously indigent and investigation of those two cases showed them to be eligible and properly certified. However, I would like to remind you that the responsibility for the proper certification of these patients lies directly with the county societies. Once a patient gets to the hospital with a court order, there is little that we can do beyond making recommendations.

Secondly, the hospital must provide educational facilities for the medical profession. We intend to meet this obligation in any way that the members of the Association wish, but tentatively we had considered the following type of program. The doors of the hospital will be open at all times to any medical practitioner of the state to observe the daily work of the hospital. Secondly, a regular schedule of ward rounds, clinics and conferences is being arranged for publication. Thirdly, special lectures, clinics and demonstrations will be arranged and announced from time to time. Finally, we are ready to cooperate with any county or other medical society or committee to the limit of our ability in arranging programs for the benefit of the members of the profession.

We of the staff hope that you, our colleagues, will find us worthy of the closest scrutiny at all times. We ask of you in return only one thing: When we displease you, as we will; when we commit errors, as we will; when we fail in the complete fulfillment of our duties to you, speak up. Only in this way can we learn. Only in this way can we raise protection against repetition of the same errors.

Dr. Malcolm T. MacEachren said of the building: "A new standard has been set for state institutions." We ask your cooperation so that the same may be said of the work done in that building.

On motion, duly seconded, the report was accepted.

The report of the Committee on Medical Economics, Dr. Carl F. Vohs, St. Louis, Chairman, follows:

## REPORT OF THE COMMITTEE ON MEDICAL ECONOMICS

Since the adoption of the final report of the Committee on the Costs of Medical Care in 1932, many states have given serious study to all social and economical conditions which have a direct bearing upon the practice of medicine. The Missouri "Medical Plan for all the People" was the first complete plan which in its entirety has been inaugurated in any state by organized medicine. After seven years of preparation, four in actual administration, the Committee feels that it is definitely approaching its goal. Our progress, however, cannot be faster than that of each component society in the State Association. Slowly, all grievances, both fancied and real, arising within the profession and with the hospitals, are being eliminated. The Committee has always felt that it is far better to have the control of these plans in the hands of the profession than in the control of commercial insurance companies as a purely business venture, or of the government of the United States on a political, bureaucratic basis. The Committee wishes to emphasize this statement at this time because there are instances in the country in which certain programs have been inaugurated without the cooperation and guidance of the local and state medical societies and are finding misunderstandings by the doctors and abuse by the patients to be an expensive item and, if not checked, may lead to unfortunate experiences.

Group hospitalization as it has spread over St. Louis and out into the state, now has a membership of 150,000.

There have been 15,000 patients hospitalized and \$660,000 has been paid to hospitals for this care. Seventeen per cent of the amount paid to hospitals during the last seven months has been for maternity care. The average stay for these cases has been 12.9 days. Both these figures are increasing slowly. From 5 to 6 per cent of the amount paid has been for accident cases and the rest for all other hospital services. The average stay of all cases has been 8.8 days; adult subscribers, male 9.17 days, female 10.27 days; dependents, male 4.1, female 8.8. The total amount of free cash reserve is \$250,000 or \$1.98 per person covered. This is approximately 30 per cent higher than any similar plan in the United States.

In the Kansas City plan there is an enrollment of approximately 41,000 with a reserve of \$37,000 above the actual and potential liabilities. Hospitalization in Kansas City has been a little higher than in the rest of the state but the plan is actuarially sound. There have been 3,113 cases hospitalized in Kansas City with \$141,542.00 paid to the hospitals. The average length of stay per patient has been 8.81. There have been 1,097 men hospitalized and 2,016 women. Of the total number hospitalized 1,731 were subscribers and 1,346 were dependents of subscribers.

Ethical interpretation and education of the public were major benefits to the community. This value is, of course, less obvious than the material benefits. At least six hospitals in Missouri have improved their institutions to meet national standards as a result of their participation in Group Hospital Service.

The larger plans are finding it necessary to call for more cooperation from physicians in order to curtail malingering and abuse of privileges. No plan can be successfully operated without the sincere cooperation of the physicians.

The Medical Economics Board of the St. Louis Medical Society has a subcommittee on every hospital staff in St. Louis which is eligible to participate in the plan. If there is any flagrant abuse of the plan, it is taken up

by the Economic Board with the staff through our Contact Committee. In this way, the board of directors and the director of group hospitalization are spared embarrassing contacts. Thus, all dirty linen is washed intramurally in all hospital staffs.

The Board of Directors of Group Hospitalization is to be commended on the detailed study it makes of any new benefit it adopts for the members of the plan and on the investment of funds. Under the direction of the American Hospital Association a national research and central analytical bureau has been established by all the ethical plans in the country, fifty-eight in number. Figures and data from all over the country are accumulated and studied making for sounder administrative policies in each plan. The Missouri Plan is a member of this association.

Many of the commercial insurance companies who entered this field because of the apparent attractiveness have now curtailed benefits and restricted services so greatly as to imperil the social value of these programs for the static income groups.

There has been nothing but praise by industry, the hospitals and the public. The press has given organized medicine credit for its earnest attempt to bring good medicine to all the people of Missouri. Engendering good will of this kind is the only way organized medicine can stop state medicine under political control. In daily contacts with industry, explaining our plan, we have educated the public as to medical care available and how they can get it for the price they can afford to pay.

The Medical Dental Service Bureau has had five years' experience in the postpayment of medical, dental and hospital bills.

Medical, dental and hospital bills budgeted up to Jan. 1, 1940, were \$263,350.

Number of patients using the Bureau up to Jan. 1, 1940, were 2,988.

The average amount budgeted by each case was \$89.63.

There were 24,477 separate payments made to the bureau amounting to \$152,000. This is an average of a little more than \$6.00 for each payment.

The Bureau also conducts the Missouri Dental Plan and the Medical Society Telephone Exchange for some two hundred physicians.

It will also be in charge of the prepayment medical plan if adopted by the House of Delegates of the Missouri State Medical Association.

The Central Registration Bureau is the general pick up of all people who cannot be served by the other bureaus mentioned. In St. Louis it is slowly beginning to function. It has been a long and tedious job. It has meant the greatest of understanding and tolerance in the development of a system of uniform accounting, changing the method of remuneration by the United Charities from a deficit basis to a per diem basis; the development of a definite admission policy to clinic and hospital for free or part pay patients and a central registration of all these patients.

Hospital trustees and administrators, state and local governmental and welfare officers, members of the medical profession and, in fact, many thinking citizens have cooperated to understand each one's place in the general setup and have helped to solve the many intricate problems.

During the last year many county medical societies have studied and some have adopted the "Pooling System" in caring for the clients of the Farm Security Administration. The Committee has not officially approved any of these plans because the House of Delegates of the Missouri State Medical Association has not adopted any type of prepayment medical plan. The Committee merely has given assistance from the large amount of data in its files. The Committee feels the

House of Delegates should give consideration and study to these plans.

In summary the Committee presents the economic program for 1940:

1. Develop the Missouri Plan for the Medical, Dental and Hospital Care of all the people in logical sequence.

2. The establishment of a Group Medical Service Plan as part of the Missouri Plan in all counties where it has been fully approved by the county medical society.

3. Coordinate in the state all the provisions of the National Health Program as they may be adopted by Congress in the Wagner or other bills through the completion of the Missouri Health Security Administration.

4. Introduce into the state legislature the following bills:

a. Revised Workmen's Compensation Act.

b. Medical Lien Bill.

c. Basic Science Bill.

d. A Registration Bill.

The Committee recognizes the element of time that is necessary to develop this program in its entirety and bespeaks the indulgent patience of all members in the leadership of the Association. The time has now come when we must express full confidence in our chosen leadership or accept domination of elements detrimental to the high standards of medicine that we have set.

CARL F. VOHS, Chairman,

E. L. JOHNSTON,

C. A. W. ZIMMERMANN,

W. F. FRANCKA,

IRA H. LOCKWOOD.

On motion, duly seconded, the report was accepted.

The report of the Committee on Mental Health, Dr. G. Wilse Robinson, Sr., Kansas City, Chairman, follows:

#### REPORT OF THE COMMITTEE ON MENTAL HEALTH

During the last year, the Committee contacted many medical and lay groups, discussing with them various important problems of mental health: (1) prevention of development of so great an incidence of mental ill health; (2) advisability of early and proper treatment in all cases of mental ill health; (3) more thorough examinations of cases of mental ill health and of those cases bordering on mental ill health; (4) methods of treatment.

Prevention of mental ill health should be begun in childhood. So-called problem children are potentially psychotic and should receive more intelligent consideration. They have a disturbance of brain nutrition. This condition must be corrected as no brain that is undernourished can function properly. The physician, the teacher and the parents should cooperate in trying to teach them a practical philosophy of living so that they may become acceptably socialized.

Neurotics and neuropsychotics are potentially psychotic and should be managed and treated cautiously. Sugar tolerance tests will show that practically all of these patients have a subnormal ability to metabolize sugar and consequently suffer from nutritional brain deficiency. Sugar and oxygen are practically the only foods used by the brain in the production of nerve energy. Therefore, the importance of the amount of sugar fed to the brain and the ability of the brain to utilize the sugar properly cannot be overemphasized.

All patients showing evidence of mental ill health should be hospitalized early, as treatment is much more effective in the early stages than it is later. The newer methods of treatment are of much value. Insulin and metrazol shock in schizophrenia are producing good results in many cases. Metrazol in involutional melancholia and in some senile psychoses is giving results bordering on the miraculous. Glucose and insulin are



giving undreamed of results in the treatment of senile confusional and toxic states. Many of these cases were formerly diagnosed as senile dementia with a hopeless prognosis.

Sugar tolerance tests done on neurotics, psychotics, drug addicts and habitués and on alcoholics show that practically all of them have a subnormal ability to utilize sugar and suffer from deficient brain nutrition. Glucose and insulin give results which cannot be obtained with any other form of therapy. These results cannot be obtained by the use of toxic sedative drugs or by conversation. The Committee has decried the use of toxic sedative drugs, especially the barbiturates, which make conditions worse instead of better and delay rather than promote recovery.

But a few years ago both private and state institutions were little more than boarding houses or nursing homes for the care of neuropsychiatric patients. Many of them are still in that class and cannot rightfully be called hospitals. But many others have evolved into well equipped hospitals where the patients receive real hospital care and attention.

The Committee believes much more attention should be given than is now being given to the subject of prevention of mental ill health. The state is spending millions of dollars annually on the quasi-care of those suffering from mental ill health and not one dollar for prevention. The Committee believes there should be in connection with the State Board of Health a Department of Mental Health supported by the state and supplied with funds (to pay competent psychiatrists) to organize the problems of prevention with medical and lay groups. As part of the program, teachers and parents of the state, especially, should be better informed concerning the management of problem children.

G. WILSE ROBINSON, Chairman,  
ORR MULLINAX,  
E. F. HOCTOR,  
F. A. CARMICHAEL,  
RALF HANKS.

### Supplement

This supplement to the report is by the chairman of the Committee. I have not asked other members of the Committee to participate because they all are engaged in state hospital work.

Missouri has spent large sums of money in building, equipping and manning charity institutions for the care of the indigent insane. The law provides that private patients may be received at these charity institutions. The intent of this provision of the law was that persons of small means who are unable to afford private hospital care may be received at tax supported institutions, these private patients paying a portion of the cost of their care and the state paying the balance.

Unfortunately, no restrictions have been placed upon the class of persons who may take advantage of this provision of the law. Therefore, people of comfortable means, and even of wealth, are being permitted to place dependents in tax supported institutions, some of them paying the small sum of \$30.00 per month which, of course, is entirely inadequate to meet the expense of what care they receive.

Others of equal means are appearing before the county courts, urging these courts to send their relatives to these tax supported institutions as county charges, paying the sum of \$6.00 per month into the county treasury, and out of the state treasury the institution receives \$12.00 per month for the patient's keep. Of course, it costs the county nothing and this procedure provides a method whereby county judges, should they wish to do so, may accommodate personal or political friends.

There have been constant complaints of overcrowding in our state hospitals and a constant clamor for larger and more spacious buildings. Overcrowding would be greatly lessened if the state institutions for the insane

were used only for the purpose for which they are intended.

Tax supported institutions should be prohibited from receiving as patients persons or dependents of persons who are able to afford private hospital care, and to give this prohibition proper force there should be stationed at each state hospital a financial investigator whose duty would be to investigate the financial status of every patient and the responsible relatives of every patient who is admitted or seeks admission to the state hospitals.

If those able to pay for private hospital care were excluded, those who are not able to pay for private hospital care and who are rightfully entitled to state care, would have more space and would receive more care from nurses and physicians.

The present situation is unfair to the indigent insane. It is unfair to the taxpayers of the state.

It will probably be said that my attitude has its foundation in personal interests. That may be partially true, but there is no more self interest in my attitude than there was in the attitude of those members of our State Medical Association who bitterly fought the establishment of the State Cancer Hospital at Columbia, or in the attitude of physicians generally throughout our nation who are waging a determined fight against state medicine. If state medicine is fair for the psychiatrist and for the psychiatric hospitals, then it is fair for the surgeons, the internists and all other branches of our profession, and for all types of hospitals.

G. WILSE ROBINSON, Chairman.

On motion, duly seconded, the report was accepted.

The report of the Committee on Maternal Welfare, Dr. Ralph R. Wilson, Kansas City, Chairman, follows:

### REPORT OF THE COMMITTEE ON MATERNAL WELFARE AND INFANT CARE

The Committee on Maternal Welfare and Infant Care submits the following report of its activities during the last year. After the precedent of former years, this report will be made in three parts.

#### A. Relationship to the Medical Profession Itself

The "refresher courses" which had been given by Drs. Bradford and Fletcher were interrupted June 1, 1939. By virtue of the drastic reduction in federal funds, no satisfactory substitute program has yet been evolved to replace the educational activities of this Committee. On the part of the Committee, it was with considerable regret that this discontinuance should be enforced. The need for such a program is obvious and before accepting the edict with finality, the Committee appealed to the Council at its meeting on November 26 in Kansas City. Unfortunately, little could be developed that justified official assistance. It is worthy of note that since the discontinuance of this educational program more interested inquiries have been received by the Committee than during the time of its actual operation.

The Annual Maternal Welfare Meeting will be held after a luncheon at the Hotel Connor on April 29, 1940. Dr. John W. Harris, Madison, Professor of Obstetrics and Gynecology at the University of Wisconsin Medical School, will be our distinguished guest and commentator. As has been the custom, a few interesting cases of maternal deaths have been selected for presentation at this meeting by members of the Association. The Committee's annual prize for the best article on obstetrical and newborn problems appearing in *THE JOURNAL* during the last year will be awarded at this luncheon.

Dr. Harris will give a formal presentation before the General Assembly in the afternoon session on the subject of "Pain Relief in Labor."

The topic of the month in the April issue of *THE JOURNAL* was "Maternal Welfare."

The Query Column in *THE JOURNAL* has been discontinued.

The Committee had a full attendance at the luncheon of the Maternal Welfare Committee Inc. held during the 1939 Session of the American Medical Association in St. Louis. Its chairman gave a rather detailed report of the operation of the Missouri Plan For Maternal Welfare up to date. Contemporary plans of twenty-four states were likewise reviewed but none seemed to approach in scope or efficiency the plan operating in Missouri.

The Committee was in full attendance at the American Congress of Obstetrics and Gynecology held in Cleveland on September 11, 1939. It was a most informative meeting consisting of thorough consideration of the educational, economical, sociological and technical phases of the specialty. It was at once apparent that each state or territory was a unit and required special methods of meeting its own particular problems.

The Committee had a full attendance at the meeting of the Central Association of Obstetricians and Gynecologists held in Kansas City on November 2, 1940. Discussion at this meeting was more or less of a continuation in many respects of problems presented at the previously mentioned meetings. At this time, the Committee began to develop a conviction, in light of the experience reported from similar committees in other states, that the majority of educational programs depending upon federal funds had a comparatively short existence.

The Committee continues its interest in the proposed Premarital Blood Test Bill which was lost in the last session of the legislature but, at the present, has decided to contribute its energy and influence in support of the spirit of the proposed Baby Health Law or The Prenatal Blood Test Bill.

In view of membership attendance at the meetings mentioned, it has not been necessary for the Committee to call special meetings to transact its affairs.

#### B. Relationship to the State Board of Health

The Bureau of Vital Statistics has provided a report each month on the maternal death rate for the Committee's use. The Division of Child Hygiene continues to furnish on request literature of an educational nature concerning the value of prenatal and postnatal care. The contents of these communications have been approved by this Committee.

Recent changes in the birth certificate are endorsed by the Committee.

#### C. Relationship to the Public at Large

The Committee continues to receive an occasional request from service and women's clubs for speakers to appear before lay audiences. During the last year these requests have been referred to the Association.

The Committee continues to be unsuccessful in its efforts to promote the showing to lay audiences of the film entitled "The Birth of a Baby."

#### Recommendations

The following recommendations are presented:

1. That support of the so-called Minimum of Standards for Obstetrical Care in Missouri Hospitals, read at the last Annual Session in Excelsior Springs, be continued.

2. That active support be given the Baby Health Law, or the Prenatal Blood Test Bill. For those who cannot accept it entirely as written, reservations and objections should be filed with the Committee on Public Policy of the Association at an early date. In view of the popular lay demand for legislation along these

lines, it is not improbable that cults or less friendly organizations will sponsor legislation inconsistent with the ideals and precepts of the Association.

3. That each component society devote during the year one full regular program to matters pertaining to problems in obstetrics or early childhood.

4. That cooperation with the State Board of Health be given as far as possible in the development of educational programs for lay audiences, with respect to the value and importance of proper obstetrical and prenatal care.

RALPH R. WILSON, Chairman,  
BUFORD G. HAMILTON,  
WINTON T. STACY,  
E. LEE DORSETT,  
JOSEPH D. JAMES.

On motion, duly seconded, the report was referred to the Reference Committee on Medical Education and Public Welfare.

The report of the Committee on Health and Public Instruction, Dr. E. Lee Miller, Kansas City, Chairman, follows:

#### REPORT OF THE COMMITTEE ON HEALTH AND PUBLIC INSTRUCTION

(McAlester Foundation)

The Committee on Health and Public Instruction (McAlester Foundation) has not been extremely active as there was little that was requested. It filled one request for a speaker before the Woman's Auxiliary at Lexington.

The McAlester Foundation is struggling for funds to do the part of the work the University of Missouri expects of the Foundation. The Committee personnel is by agreement between the Council and the McAlester Foundation composed of five members as follow: one a graduate of the University of Missouri School of Medicine, one a member of the faculty of that school, one a member of the Veterinary School and two members from the Association. The Committee is not so composed. This irregular although slight change is of no real importance.

The Committee remains ready to supply persons upon request of any deserving and sincere audience.

The Committee met in Columbia, March 14, with the following members present: Drs. A. R. McComas, Sturgeon; F. G. Nifong, Columbia; John S. Knight, Kansas City; E. Lee Miller, Kansas City; Howard A. Rusk, St. Louis, and A. J. Durant, Columbia.

Dr. E. Lee Miller, Kansas City, was elected Chairman and Dr. Dudley A. Robnett, Columbia, reelected Secretary.

E. LEE MILLER, Chairman,  
A. R. MCCOMAS,  
F. G. NIFONG,  
JOHN S. KNIGHT,  
HOWARD A. RUSK,  
DUDLEY A. ROBNETT,  
A. J. DURANT.

Dr. E. Lee Miller, Chairman, reporting further, said: This is a peculiar committee in that it combines the Committee on Health and Public Instruction with the McAlester Foundation. The intention of the Committee is to furnish speakers for lay education, to formulate programs and to furnish speakers for any kind of program. We are ready and all you have to do is tell your lay audiences that we will furnish speakers.

On motion, duly seconded, the report was accepted.

The report of the Committee on Constitution and By-Laws, Dr. Floyd H. Spencer, St. Joseph, Chairman, follows:



## REPORT OF THE COMMITTEE ON CONSTITUTION AND BY-LAWS

The following proposed Constitution was introduced at the 1939 Excelsior Springs Session of the Association.

### ARTICLE I—NAME

The name and title of this organization shall be the Missouri State Medical Association, and by such name shall have the right to contract and be contracted with, to plead and implead, to sue and be sued, and shall have the right to acquire, own, hold, mortgage and dispose of such real and personal property as shall be necessary for a proper maintenance and conduct of its affairs.

### ARTICLE II—PURPOSES

The purposes of this Association shall be to bring into one compact organization the medical profession of the State of Missouri; to extend medical knowledge and advance medical science; to elevate the standards of medical education; to promote friendly intercourse among physicians; to safeguard the professional integrity of its members and to establish and maintain them in appropriate and equitable relationship with the public, with the government and with all agencies working in the field of health and welfare; and to enlighten and direct public opinion in regard to the problems of medicine and health for the best interest of the people of the state.

### ARTICLE III

This Association shall have the right to enact By-Laws providing for the government, management and control of the Association.

FLOYD H. SPENCER, Chairman,  
HERBERT S. LANGSDORF,  
ROBERT VINYARD,  
B. LANDIS ELLIOTT,  
HERBERT L. MANTZ.

DR. HERBERT L. MANTZ, Kansas City: The Committee on Constitution and By-Laws proposes a constitution but its adoption at this time depends upon the adoption or rejection of by-laws. The proposed constitution also contains some amendments and the Committee proposes that this report be referred to the Reference Committee on Amendments to Constitution and By-Laws for the addition of these amendments and then be laid on the table for one year.

On motion, duly seconded, the report was referred to the Reference Committee on Amendments to the Constitution and By-Laws.

The report of the Committee on Fractures, Dr. M. L. Klinefelter, St. Louis, Chairman, follows:

## REPORT OF THE COMMITTEE ON FRACTURES

The Committee on Fractures has little of a progressive nature to report. The Committee has not met since the last Annual Session but has cooperated with the Association in postgraduate work and has taken care of all the calls received from the Postgraduate Committee. Members of the Committee have made a number of individual talks, the result of personal requests by societies, that did not come through the Postgraduate Committee.

The Committee has received good cooperation from the State Highway Commission, particularly in preventing accidents, and the Red Cross is still making progress in establishing emergency treatment stations.

M. L. KLINEFELTER, Chairman,  
FRANK D. DICKSON,  
WM. J. STEWART,  
H. K. WALLACE,  
JAMES D. HORTON.

On motion, duly seconded, the report was accepted.

The report of the Committee on Conservation of Eyesight, Dr. C. P. Dyer, St. Louis, Chairman, follows:

## REPORT OF THE COMMITTEE ON CONSERVATION OF EYESIGHT

The Committee is now only two years old, yet its work and accomplishments reflect the active interest of each and every member of the Committee. The Chairman wishes to thank these Committee members, each of whom has given much of his valuable time to this work.

A short meeting of the Committee was held on April 10, 1939, during the Excelsior Springs Annual Session.

A continued effort has been made to educate the component medical societies in the conservation of eyesight.

The September issue of THE JOURNAL carried a symposium on "Conservation of Eyesight." A number of requests for copies of this issue were received from other state associations. Eleven papers were written and published by members of the Committee during the year.

Members of the Committee have made a number of radio talks over St. Louis, Kansas City, Joplin and other stations that undoubtedly reached many thousands of listeners. The value of the radio in the conservation of eyesight program cannot be estimated but it should be used much more extensively than it has in the past.

A number of exhibits have been placed before various organizations. The most important was the one at the St. Louis Session of the American Medical Association which was shown during the entire week. This exhibit was viewed by more than 5,000 and many inquiries were made by physicians from other states who were interested in a conservation of eyesight program for their state.

Motion pictures on "Seeing How You See" were exhibited thirty-five times before civic clubs, county medical societies, high schools, parent-teachers associations and other organizations to a total audience of more than 7,200.

Dr. Winfred L. Post, Joplin, has caused sight testing to be installed in all grades at some of the schools in his district.

Repeated requests have been received from different parts of the state for a carefully prepared pamphlet on conservation of eyesight. This Committee expects to publish such a booklet soon and to be able to distribute it throughout the state, especially to school children. The importance of educating children to conserve their eyesight and to be sure and obtain proper medical attention for all eye conditions should be stressed continually by each and every physician.

The physicians of the Association are urged to cooperate and assist the Committee on Conservation of Eyesight in the coming year.

The Committee acknowledges the cooperation and efficient work of the Associate Members, Dr. G. A. Hornback, Dr. C. Souter Smith, Dr. G. J. Tygett and Dr. C. R. Bruner.

CLYDE P. DYER, Chairman,  
PHILIP S. LUEDDE,  
ROBERT S. MINTON,  
JOHN MCLEOD,  
WINFRED L. POST.

On motion, duly seconded, this report was accepted.

The report of the Committee on Control of Venereal Disease, Dr. G. V. Stryker, St. Louis, Chairman, follows:

## REPORT OF THE COMMITTEE ON CONTROL OF VENEREAL DISEASE

The Committee on Control of Venereal Disease met in Jefferson City at the Missouri Hotel, October 11,

1939, at 11:30 a. m., with the following present: Dr. G. V. Stryker, St. Louis, Chairman; Dr. C. T. Ryland Lexington; Dr. Q. U. Newell, St. Louis; Dr. Richard L. Sutton, Jr., Kansas City; Dr. John W. Williams, Jefferson City, Assistant State Health Commissioner, and Mr. E. H. Bartelsmeyer, Executive Secretary. Dr. W. S. Sewell, Springfield, was absent.

The chairman briefly reviewed the action taken by the Committee at its meeting of March 2, 1938, which was reported to the House of Delegates at the 1938 Annual Session as follows:

#### QUESTIONS FOR SOLUTION IN THE SYPHILIS CONTROL PROGRAM:

1. *System of Notification.*—From the statistics presented by the State Board of Health it is apparent there is an urgent need of complete cooperation on the part of physicians to report all cases of syphilis on the card furnished by the Board of Health. Without the complete cooperation on the part of physicians in this respect (the basis of the solution to our problem) any program instituted will fail.

It was suggested that the present card for reporting syphilis be changed to include additional statistical information. Dr. Williams volunteered to secure the necessary information from the postal authorities so that the statistics added would be included in the franking privilege. The Committee was in accord with the rule to be promulgated by the Board of Health that the reporting of cases be by name or number. We have been assured by the Board of Health that the records will not be subject to public inspection. The new reporting card is now being developed and will shortly be distributed for use by physicians.

Dr. Williams informed the Committee that a new reporting card had been developed with franking privilege and a copy of the book containing the cards had been delivered personally to all physicians in rural areas by the district health officers. He called special attention to the fact that the franked envelopes could be used only for reporting cases. It was pointed out that reporting was being done at the present time by name or initials. Compared to 1938 only two thirds of the cases were reported in 1939, due perhaps to the great number of old cases being reported in 1938. Approximately 5,000 cases of primary syphilis have been reported from rural Missouri excluding Kansas City and St. Louis.

2. *Additional Laboratory Facilities Needed for the Diagnosis of Syphilis.*—It was the consensus of the Committee that the state laboratory facilities be utilized and that if additional laboratory facilities are required such private laboratories as may be approved by the State Board of Health be included in the program.

It was reported that there has been a marked increase in laboratory work and that the State cannot subsidize private laboratories and that it has no authority under present statutes to approve laboratories.

3. *Distribution of Antisyphilitic Drugs.*—We recommend that the practice of supplying drugs for indigent patients be continued by the Board of Health through the attending physician.

Bismuth and neoarsphenamine are being furnished to all physicians who report cases of syphilis and request the drugs. The matter of indigency is being left entirely to the physician.

The question arose as to whether the State Board of Health would furnish the drug "Mapharsen" if requested by the physician. It was pointed out this drug had not as yet been approved by the United States Public Health Service. The Committee decided to study the matter further.<sup>1</sup>

4. *Free Treatment Facilities for Those Who Cannot Pay Physician's Fees.*—The plan of the Board to establish public health districts in rural sections composed of adjoining counties for the control of indigent patients suffering from communicable diseases including syphilis was approved. We believe in the establishment of these districts; that the view of the Committee on Medical Economics should be obtained so

1. The Committee recently has been informed that Mapharsen is furnished in forty of the states supplying free anti-syphilitic drugs. Missouri, Arkansas and Oklahoma are the only states at present among states in which the State Boards of Health supply arsenicals in which Mapharsen is not available.

that the general program be unified and the districts operate as an economic unit for all indigents requiring medical attention.

It is desirable that the programs in the respective districts be supervised by a competent physician. This physician should be on a salary basis and chosen on the basis of competency. In larger communities where clinics may be established, the personnel should rotate the service and receive compensation for such service on a basis to be worked out by the Board of Health. This should be worked out in cooperation with the local county medical society. It is the plan of the State Board of Health, in those communities where public health districts have been or will be established, to secure the services of several local physicians in each respective district to administer antivenereal treatment. The Committee recommends that the local county medical society in cooperation with the Councilor of the district recommend one of its members, who is competent in work of this character, to the State Health Commissioner for such appointment to treat those indigent patients which are referred to him by the Health officers supervising the district. This program is designed not to interfere with the practice of any physician who has an indigent patient under his care and the supplying of free drugs to the patient. Furthermore, if a local county is at the present time paying fees to physicians for the care of the indigent sick, this relationship must not be disturbed. All indigents, however, are to have free choice of physicians. If the physician so chosen by the patient does not desire to treat the case, he will refer such patient to the District Health Officer who in turn will authorize treatment by the physician recommended by the society to treat such indigent cases. In those counties where the physicians are not organized as a county medical society it is recommended that the Councilor cooperate with the State Health Commissioner in the selection of the local physician. The fees to be paid to the local physician for such treatment will be worked out by the State Health Commissioner depending upon the amount of money available for this purpose and the amount of treatment found necessary to be given.

Dr. Williams reported that under the plan suggested only two private physicians had been appointed due to a lack of cooperation by councilors and county societies in recommending physicians for such appointment. It has been necessary to establish so called "circuit riders" in certain counties in the southwest and southeast portions of the state and four additional circuits would be established at an early date in other parts of the state. Due to the long distance many patients had to travel (20 miles in some instances) by walking, a bus transporting service would soon be installed in the southeast portion of the state including Cape Girardeau, Scott, Mississippi, New Madrid, Pemiscot and Benton counties.

The Prenatal Examination Bill was given serious consideration. The consensus of the Committee seemed to favor such a bill. Details are to be discussed at a later meeting.

In discussing the Premarital Examination Bill the need for a more elastic measure than for syphilis only was brought to light. The physician should pass upon the health of applicants to marry. This is not the function of a clerk.

G. V. STRYKER, Chairman,  
QUITMAN U. NEWELL,  
C. T. RYLAND,  
W. S. SEWELL,  
R. L. SUTTON, JR.

On motion, duly seconded, the report was accepted.

The report of the Committee on Study of Medical Practice Laws, Dr. Lee D. Cady, St. Louis, Chairman, follows:

#### REPORT OF THE COMMITTEE ON STUDY OF MEDICAL PRACTICE LAWS

The Committee has had no called meetings but it has continued work. The tabulation and study of many premarital and prenatal examination laws has been continued. Sufficient data on premarital examination laws is being accumulated to show rather plainly that examination for gonorrhea is impractical because the laws are evaded too much and because clinical tests are not sufficiently reliable.

It is beginning to appear that a compulsory blood test for syphilis may be reasonable as a requirement



before marriage. In this respect, the proposed bill of the Young Men's Division, St. Louis Chamber of Commerce, which was introduced in the 1939 General Assembly, seems to be the most carefully written and most practical from public health and legal viewpoints of the physician. The Committee recommends it for favorable consideration if the Association endorses any particular bill.

The Committee is not unanimous in approving the prenatal blood test bill of the Missouri Social Hygiene Association but the majority approves the proposed bill with certain promised minor modifications. The majority of the Committee does, therefore, recommend that the House of Delegates approve this bill in principle and in particular.

A proposed Harmful Drug Restriction Bill was published in *THE JOURNAL*, December 1939. The Committee recommends the approval of such a bill whenever expedient to the Association.

Basic Science and Medical Injunction bills again are urged for passage.

A Medical Lien Bill, in conjunction with dental, hospital and nursing liens, and an Annual Registration Bill again are recommended for passage.

A translation and study of the Belgian "Integrative" Medical Practice Law has been made. The Committee recommends the Annual Registration bill because it is part of the goal of "integration." For the same reason, it is further recommended that the present medical practice law be brought up to date with respect to requiring two years of acceptable premedical study and a year of acceptable internship. It is desirable to make some legislative attempt to specify the proper usage of the title "Doctor" in the practice of the healing art. A better legal definition of a physician and the practice of medicine, surgery and midwifery is desirable also.

Since this Committee's existence depends upon the annual decision of the House of Delegates, the following resolution is hereby submitted:

WHEREAS, There is still need for further study of laws which concern the practice of medicine, therefore be it

Resolved, That the Committee on Study of Medical Practice Laws be and is hereby authorized to continue its work for another biennium.

LEE D. CADY, Chairman,  
T. W. COTTON,  
O. C. GEBHART,  
E. D. JAMES,  
M. PINSON NEAL,  
J. MILTON SINGLETON,  
E. L. SPENCE.

On motion, duly seconded, the report was accepted.

The report of the Committee on Tuberculosis, Dr. E. E. Glenn, Springfield, Chairman, follows:

#### REPORT OF THE COMMITTEE ON TUBERCULOSIS

The Committee on Tuberculosis aided in arranging a symposium on "Tuberculosis" which was published in the November 1939 issue of *THE JOURNAL*. The papers published were: "The Prevention of Pulmonary Tuberculosis," Dr. Herbert L. Mantz; "Symptoms, Signs and Diagnosis of Pulmonary Tuberculosis," Dr. J. A. Stocker; "Differential Diagnosis of Chronic Pulmonary Diseases," Dr. Dan N. Myers; "Sanitarium Treatment of Tuberculosis," Dr. George D. Kettelkamp; "Home Treatment of Pulmonary Tuberculosis," Dr. William M. Kinney; "Surgical Procedures in the Treatment of Pulmonary Tuberculosis," Dr. J. L. Mudd, and "Missouri Tuberculosis Association," Donald E. Pratt, Executive Secretary.

Letters have been written to all county medical societies in the state urging the appointment of a committee on tuberculosis. Reports have been received from the following county societies announcing that

such a committee has been appointed: Barry, Barton, Benton, Buchanan, Clay, Clinton, Greene, Jackson, Lawrence-Stone and St. Louis City. It is believed that these committees on tuberculosis in the county societies can be helpful in urging that lectures and demonstrations on tuberculosis be given before the societies in order to stimulate interest of the medical profession in diagnosis, prevention and treatment of tuberculosis. These committees also should act as contacts between the voluntary and official agencies who are doing tuberculosis work and the local physician who is in private practice.

The Committee has supported and aided the Missouri State Tuberculosis Association in holding conferences on roentgen ray examinations of the chest. The first of these conferences was held in Jefferson City in December and the second in Columbia in March. At these conferences technic and interpretation of chest roentgenograms were discussed and demonstrated. The conferences have proven to be a medium of exchange of ideas in regard to roentgenography of the chest, and to convey knowledge of this procedure to physicians who only occasionally make roentgen ray examinations of the chest.

Only a beginning has been made in the work that this Committee should do. However, the Committee feels that this beginning has been quite worth while and in the proper direction and that the Committee on Tuberculosis in the future can be helpful in various capacities. The county society committees can be helpful in aiding and stimulating the county societies to obtain speakers on tuberculosis. It is the feeling of the Committee that each county society should devote at least one program to tuberculosis during the year.

It is suggested that the Committee on Tuberculosis cooperate with the Missouri Tuberculosis Association in arranging an interesting and valuable scientific program for the annual meeting of the State Tuberculosis Association. During the last year there has been a close cooperation between the members of this Committee and the State Tuberculosis Association. The Committee feels that the continuance of this cooperation will be of mutual aid to both organizations.

E. E. GLENN, Chairman,  
GEORGE D. KETTELKAMP,  
R. H. RUNDE.

On motion, duly seconded, the report was accepted.

The report of the Committee on Industrial Health, Dr. E. C. Funsch, St. Louis, Chairman, follows:

#### REPORT OF THE COMMITTEE ON INDUSTRIAL HEALTH

The parent organization, the Council on Industrial Health of the American Medical Association, was formulated less than two years ago, and most of the efforts have been in organizing a program, this being a subject that has great possibilities but one that must be approached with a great deal of thought and study as the potential possibility of adverse criticism is as great as the possibility of doing public service.

After the meeting in Chicago in January 1940 the following was reported:

1. There are now thirty-four committees on industrial health or closely related agencies in state medical associations where almost none existed before the present campaign.

2. The establishment of such committees in the state societies without question has had the effect of coordinating activities relating to health control of the employed population through assignment of responsibility to a single agency in the state structure.

3. The activities of the committees have been undertaken according to a program which has quite well defined objectives.

4. The appeal which this method of attack has had

to state societies is reflected in the extension of these activities into county societies.

5. A background of educational experience is being erected varying from the preparation of exhibits at state society meetings to comprehensive postgraduate teaching as, for example, in Michigan and Maryland.

6. There has been some increase in the number of articles published on industrial health subjects in state medical journals.

7. The state committees have acquired a much better idea of who is engaged in industrial practice in their own states and have begun to feel that standards can be raised only if more is learned about the characteristic types of services which physicians are called upon to provide in industry, especially in small plants.

8. Similarly, interest has been aroused in the training or experience which a physician should have successfully to conduct an industrial medical service.

9. Committees in the state medical associations are beginning to appraise the usefulness of other agencies who have or should develop an interest in industrial health as, for example:

a. Attention has been directed to the administration of workmen's compensation, more particularly the part which organized medicine plays in defining medical standards.

b. Much interest has been aroused in the programs of bureaus of industrial hygiene in state governments.

10. A bulletin has been established for the interchange of ideas regarding industrial health.

11. The first of a series of informal round table discussions has been held in connection with the Annual Congress on Industrial Health which is designed to provide a forum for the discussion of organizational and administrative aspects of industrial health.

These results were reviewed in connection with the report of the Committee on State Associations at the recent January 14, 1940, meeting of the Council on Industrial Health. Other sections of this Committee report refer to future plans and additional requests for cooperation from members of the state committees. Examples of activity in various states were reported. Considerable discussion occurred regarding field activities and the Council felt that if such were developed, a good share of its initial program might profitably be directed toward assisting state committees along the lines enumerated.

Other actions taken at the Council meeting which might be of interest to the profession follow:

The Committee on Education and Publications reported on the material gathered for a special industrial health issue of *THE JOURNAL*, emphasizing particularly a general statement about the essential nature of industrial health problems and present medical relationships in industrial medical practice.

Other special publications are in the process of preparation. The series of articles on pneumoconiosis by Dr. Leroy U. Gardner is approaching completion. Another series on medical organization in industry is being prepared for presentation in *THE JOURNAL*, and still another series of authoritative presentations on the occupational diseases is being projected.

As part of this committee report, the Council reviewed the previous action with reference to industrial medical education, the material to be published along these lines in the industrial health number and, most important, the need for a syllabus which would define clearly the ideal content of a course in industrial hygiene, the time necessary for adequate teaching, the qualifications desirable in the teaching staff and the availability of suitable clinical material. Once developed, such a syllabus can be submitted to the Council on Medical Education and Hospitals. If acceptable, it can be resubmitted through that agency to the medical schools. Such a syllabus also would in large part

be easily adaptable to organized postgraduate teaching progress.

The Committee on Standards of Industrial Practice reported that the Council from the outset has felt that a statement should be developed which would have the effect of improving the status of industrial physicians as ethical practitioners by establishing standards of conduct specific in character, acceptable for wide adoption in this country. A precedent for such a statement is contained in "The Duties of Ethics of Industrial Medical Practice of the British Medical Association." A first draft of such a statement was presented to the Council as a report of progress. It was felt that this activity will ultimately exert considerable influence on industrial practice.

The correlation of activities with other agencies in the American Medical Association was discussed. A review of cooperative enterprises which have been engaged in by the Council and other agencies in the American Medical Association took place.

Particular reference was made to the work of the Council on Physical Therapy which is studying: (1) cult practitioners and the management of low back pain; (2) appraisal of resuscitation equipment; (3) appraisal of methods of amputation and the manufacture of artificial limbs; (4) evaluation of hearing aids, and (5) estimation of hearing loss and the accurate measurement and recording of disability by means of audiograms.

Similarly the Council on Pharmacy and Chemistry has advised the Council on Industrial Health on the indiscriminate use of oral cold vaccines in industry, both with and without the permission of industrial physicians.

The relationships between the Council and the Section on Preventive and Industrial Medicine and Public Health were reviewed. The Council expects to extend every cooperation to the Section officers in developing its programs.

The functions of the Council as a clearing house of information regarding industrial health problems were discussed. No change was recommended in the present method of dealing with inquiries which are referred when necessary to individual authorities who act as referees in the preparation of suitable replies. However, the possibilities for the development of suitable subcommittees was introduced.

The desirability of learning something about the number of physicians engaged in industrial practice and the characteristic types of service they are called upon to perform had been approved by the Council at a previous meeting. Results of this census were reported. It was felt that this activity is justified since there can be little possibility for advancing the standards of industrial medicine unless reasonably complete information is at hand about the men who practice it and what they practice.

A questionnaire has been directed to workmen's compensation commissions in the United States and Canada to provide some insight into the present status of medical advisory boards to compensation agencies.

By means of a special grant from the Board of Trustees, the Council is undertaking the preparation of special educational exhibits which will be made available to state medical societies and other meetings. An exhibit on pneumoconiosis is in the process of preparation and others are tentatively planned on carbon monoxide, industrial physical examination and industrial dermatitis. The development of a permanent exhibit along industrial health lines at the Museum of Science and Industry in Chicago was advanced as a feasible idea for sponsorship by the American Medical Association if the cost be not too great.

It has been recommended that the Council undertake the preparation of a bibliography of important publica-



tions in the field of industrial health, a project to be explored by the Committee on Nomenclature.

There was a feeling that the Council might properly take some initiative in the matter of adequate training of nurses for industrial activity.

The personnel, methods, and scope of activity of the Industrial Medical Research Council of Great Britain were studied with the thought in mind that the organization of this agency might reveal some useful aspects applicable to industrial health in this country.

E. C. FUNSCH, Chairman,  
J. E. CASTLES,  
W. M. KINNEY,  
H. I. SPECTOR,  
G. T. BLOOMER.

The following supplementary report was presented:

#### Supplementary Report of the Committee on Industrial Health

After the publication of "Living, Working and Health Conditions in the Tri-State Mining Area" (Missouri, Kansas and Oklahoma) issued by the Tri-State Survey Committee, Inc., 100 Fifth Ave., N. Y., an open meeting was held at Washington University, St. Louis, April 16, 1940. Miss Elizabeth White, New York, Acting Secretary of the Tri-State Survey Committee, presided. A motion picture was presented showing, in general, working conditions that predispose to silicosis and some specific shots of the tri-state area, followed by a general discussion. The purpose was to acquaint the public with conditions that exist in this area.

After publication of the report, the United States Secretary of Labor, Honorable Frances Perkins, called a meeting over which she presided at Joplin, April 23, 1940. To this she invited representatives of the United States Public Health Service, United States Bureau of Mines, United States Housing Project, State Health and C.I.O. Labor representatives from Missouri, Kansas and Oklahoma, State Medical Association representatives, mine operators, members of the Workmen's Compensation Commissions, social and religious organizations, most of which were represented. The undersigned represented your State Medical Association and accompanied Miss Perkins on her visit to parts of each of these states and inspected the actual working conditions down in a mine at Picher, Oklahoma.

There is an area which comprises a part of Missouri, Kansas and Oklahoma that contains rich mineral (zinc and lead) deposits; this rock has a high silica content, the mining of which has caused a large number of cases of silicosis and subsequent tuberculosis.

In 1914, the Public Health Service made an extensive survey and found a large percentage of silicosis among the miners; they found that dust was responsible for getting the silica into the lungs and recommended water and suction apparatus, etc., to attempt to control the dust. The larger companies have adopted these and other devices to protect the health of the miners. One of the United States Public Health men, who was on the 1914 survey, attended this meeting and stated that the percentage of silicosis had greatly decreased by the use of safety devices but that there was still silicosis appearing.

Information from the mine operators is that profitable veins in Missouri have been worked out and many mines have been abandoned; most of the large scale mines are now in Oklahoma and Kansas. It seems that when a mine is abandoned, the company moves away leaving parts of the buildings not worth moving and these large chat hills which are enormous piles of ground rock from which the zinc or lead has been taken but in which the silica remains. The ground reverts to the county for nonpayment of taxes. When the price of ore becomes high enough, small groups of

miners will work small veins with little or no health safety measures.

Information from the health officers and members of the Workmen's Compensation Commission of our state is that there are very few new cases of silicosis being reported in Missouri due to the mining being shifted to Oklahoma and Kansas, where apparently silicosis is still being found.

The housing conditions are bad; shack after shack is seen as one rides through the district and, on investigation, they are found to be unsanitary and overcrowded, with no sewerage; water is brought in by auto tanks and sold. I am told that the incidence of tuberculosis, venereal disease and all the ills that go with undernourishment are high and one can easily see the cause. The roads are made of this chat and on windy days the air must be filled with the dust from the roads and chat piles. One United States department authority told me he did not believe silicosis could be contracted in this way while, on the other hand, a health officer in one of the neighboring states says he is conducting an investigation among the families of miners and has found silicosis in people who have lived in these surroundings and have never been underground or worked in the mines.

Dr. Alice Hamilton, who needs no introduction as one of the country's foremost authorities on industrial toxicology and who accompanied Miss Perkins, remained in the territory to make dust counts and other experiments on this question. Her report should be of great assistance.

The Missouri State Health Department has set up a health unit in Missouri's part of the district with both full and part time doctors and nurses to help these people in their general health problems.

The undersigned's impression was that the larger companies were endeavoring to establish health protective measures for their workmen; whether they were doing everything that is known in this line, time did not permit the undersigned to investigate. The big problem appeared to be one of economic distress, similar to those found in many parts of the United States where the peoples' earning power is so low that it does not permit proper housing, clothing, food, etc., and leads to overcrowding, undernourishment and prevalence of communicable diseases, particularly tuberculosis.

E. C. FUNSCH, Chairman.

On motion, duly seconded, both reports were accepted.

The report of the Committee on Rural Medicine, Dr. H. A. Lowe, Springfield, Chairman, was read and referred to the Reference Committee on Medical Education and Public Welfare.

#### Appointment of Committee on Nominations

The President announced the appointment of the Committee on Nominations as follows:

Morris B. Simpson, Kansas City, Chairman.

R. E. Breuer, Newburg.

A. C. H. Van Ravenswaay, Boonville.

H. A. Lowe, Springfield.

O. B. Hall, Warrensburg.

I. E. Goldberg, Polo.

O. W. Koch, St. Louis.

Robert Mueller, St. Louis.

J. S. Gashwiler, Novinger.

C. A. W. Zimmermann, Cape Girardeau.

Dr. E. H. Skinner, Kansas City, requested the privilege of the floor and on motion, duly seconded, was accorded the privilege. Dr. Skinner spoke on the National Physicians' Committee for the Extension of Medical Service.

On motion the House of Delegates recessed until 4:30 p. m.

## Monday, April 29, 1940—Afternoon Session

The adjourned session of the House of Delegates convened at 4:30 p. m., Monday, April 29, with Dr. M. Pinson Neal, Columbia, Speaker of the House, presiding.

The report of the Council, Dr. Curtis H. Lohr, St. Louis, Chairman, follows:

## REPORT OF THE COUNCIL

The Council of the Missouri State Medical Association met in St. Louis in the Council Room of the St. Louis Medical Society Building on May 14 at 10:00 a. m. Dr. Curtis H. Lohr, St. Louis, Chairman, presided. In attendance were Drs. A. S. Bristow, Princeton; Curtis H. Lohr, St. Louis; R. B. Denny, Creve Coeur; W. A. Bloom, Fayette; A. J. Campbell, Sedalia; E. P. Heller, Kansas City; H. L. Kerr, Crane; E. J. Nienstedt, Sikeston; James R. McVay, Kansas City, President; C. E. Burford, St. Louis, President-Elect; R. L. Thompson, St. Louis, Treasurer, and E. H. Bartelsmeyer, St. Louis, Secretary.

The Treasurer recommended that an attempt be made to collect delinquent dues and reported the status of funds of the Association as follows:

General Fund .....	\$10,031.55
Defense Fund .....	1,220.76
Legislative Fund .....	2,120.62
Sinking Fund .....	4,269.00
Total .....	\$17,641.93

A written report of the Council's special Committee to Study the Problem of Refugee Physicians in Missouri, Dr. A. Morris Ginsberg, Kansas City, Chairman, was presented and referred to the Committee on Public Policy for study and recommendation. The report follows:

The special committee named by the Council to study the problem created by the refugee physicians coming into the State of Missouri met in Kansas City on Sunday, March 19, 1939. There were present Dr. Daniel B. Landau, Hannibal; Dr. Charles Greenberg, St. Joseph; Dr. I. M. Goldberg, Polo, and Dr. A. Morris Ginsberg, Kansas City, Chairman. We were fortunate in having with us during a portion of our meeting Dr. E. P. Heller, Kansas City, who came at the invitation of your Chairman.

Our committee was conscious, of course, that all of its members were Jewish, whereas the problem of resettlement of foreign physicians, while perhaps predominantly Jewish, is not entirely so. However, we felt honored to be assigned so important a task and if the results of our deliberations shall prove helpful to the Association and to the refugee doctors, of whatever religious faith, we will be extremely gratified.

Much has been said and written concerning the great influx of foreign doctors as a result of religious and political persecution abroad and we felt it our first duty to find out how nearly correct these reports have been. According to *Time* (February 13, 1939) there has been much loose talk concerning the seriousness of this problem. *Time* reported as follows:

'Contrary to popular opinion, there are not 25,000 emigre physicians in the United States. According to the American Medical Association there are only about 1,180. These have trickled in over a period of six years. In a country which boasts 170,000 licensed medical men, 1,180 is an inconsiderable number. Yet a tremendous hue and cry has been raised by American physicians against the hospitality that the United States has extended to foreign 'competitors.' Last week *Medical Economics* which reaches the office of almost every doctor in the United States issued a loud blast against 'Refugees unlimited.'

'Asserting boldly that 1,000 European physicians, mostly Germans, are entering the United States every year, *Medical Economics* stated that foreign doctors are 'coming in droves' to the United States, painted a gloomy picture of the unrestricted immigration, unfair competition of emigres with American doctors and low standards of medical treatment.

'Against *Medical Economics* stands the opinion of several hundred of the most eminent physicians in the United States, who have formed committees in several large cities to help their unfortunate colleagues. During the next three years, say these physicians, no more than 2,500 European physicians will come to settle in the United States and the United States is certainly large enough to absorb them. Many of these men are outstanding scientists, and will contribute greatly to the progress of American medicine.'

Prior to the date of our committee meeting, we made a complete analysis of emigre physicians and medical students who are now in the State of Missouri. Contrary to popular opinion, the number is almost negligible there being a total, including practicing physicians, medical students, interns and

teachers of all religious faiths and from all foreign countries, of only thirty. This summary is broken down as follows:

	Licensed Physicians	Resident Doctors	Interns	Dentists	Students
St. Louis	4	0	7	1	5
Kansas City	1	1	1	2	0
St. Joseph	0	0	1	0	0
Fulton	0	1	0	0	0

	Unattached	Teachers
St. Louis	1	4
Kansas City	1	0
St. Joseph	0	0
Fulton	0	0

In view of these facts, we are of the opinion that at the present time Missouri doctors need not be alarmed about the situation. However, to whitewash the matter by simply saying "the problem doesn't exist" would constitute, in our opinion, a report which might well be subject to criticism.

As you know, public health officials in Missouri as well as this Association have been for many years and are now confronted with the very serious problem of distribution of physicians. We all know that there are a multitude of small communities in Missouri where no doctor practices, or where young, energetic cultists have successfully entered the practice of medicine by reason of the advanced age or the incompetence of medical men in the community. Not only are the people of the community suffering but doctors in these communities and in nearby centers of population are likewise suffering. These cultists do not bring their patients to the hospitals in nearby cities and towns and consequently public health in Missouri has suffered. In some communities these cultists have been named public health officials because no doctor was available for the appointment.

Accordingly, we believe this Association could render a distinct service to the state by fostering a plan of distribution of emigre physicians in communities where they are needed. This would contemplate, of course, keeping them out of communities in which the profession is already overcrowded.

Such a plan could be accomplished and at the same time aid could be rendered our unfortunate brothers from abroad.

It is our recommendation that this Association cooperate with the Board of Health to the end that the latter be induced to issue temporary licenses to emigre physicians who are otherwise qualified to practice medicine in Missouri, and that this Association appoint a permanent standing committee to advise the Board of Health of the location of communities in Missouri wherein adequate medical service is not available. We recommend that such temporary licenses be issued for a term of five years and that the holders thereof be continuously under the sponsorship, guidance and supervision of the Board of Health. Needless to say, the Board would have the power to revoke any such license in the event the holder thereof should fail or refuse to live up to any reasonable regulations of the Board. In that way the Board could, with the advice and cooperation of this Association, assist small communities in which first-class medical service is not available by requiring holders of temporary licenses to practice in a choice of such communities. All Missouri could in that way have the benefit of the services of highly trained physicians, but without detriment to American physicians who are already established, with whom such emigre doctors would not be in competition.

We recommend that the Association make its desires in this connection known to the Central Committee for the Resettlement of Foreign Physicians, New York, a nonsectarian body composed of such outstanding physicians as Dr. Clarence Bandler, Dr. Lewis A. Conner, Dr. Nathan Chandler Foot, Dr. Willard C. Rappeleye, Dr. J. Bentley Squier, Dr. Homer Swift and others. This committee is prepared to make careful selection of candidates, through its various Boards of Review, and to submit them to the Missouri authorities for action. Any candidate submitted will have been determined by the committee to be medically and ethically qualified.

We feel that this Association should take a definite stand in this matter, looking forward toward Missouri's cooperation in the humane and practical absorption of the very small number of foreign physicians who have come and are coming to America. The method we have outlined calls for dignified consideration and calm, yet effective, deliberation and action.

Respectfully submitted,

A. MORRIS GINSBERG, Chairman.

The Council decided to recommend to the House of Delegates that hereafter Delegates to the American Medical Association be reimbursed at the rate of 5 cents a mile each way plus \$5 a day while in attendance at the Session.

The General Committee on Arrangements, composed of Drs. H. L. Kerr, Crane, Chairman; A. J. Campbell, Sedalia, and E. P. Heller, Kansas City, was instructed to select the general chairman of the Local Committee on Arrangements for the Joplin Session. The President and Secretary were instructed to select the date of the meeting.



It was decided to request a joint meeting of the State Cancer Commission, the Committee on Cancer and the officers of the Association.

An offer of Radio Station KFUE, St. Louis, extending the use of the facilities of the Station without charge on Friday nights during September was accepted and a special committee was appointed as follows: Dr. Curtis H. Lohr, St. Louis; Dr. C. E. Burford, St. Louis, and the Secretary.

It was decided to hold a joint conference of presidents and secretaries of component societies and officers of the Association some time in the fall.

Dr. E. P. Heller, Kansas City, was instructed to represent the Association at the dedication of the Ephriam McDowell Memorial at Danville, Kentucky, May 20, and act for the Association as one of the custodians in the permanent organization to be formed.

### Meeting of June 11

The Council of the Missouri State Medical Association and the Committee on Cancer met in joint session with the State Cancer Commission at the University Club, St. Louis, on Sunday, June 11, at 10:00 a. m., Dr. Curtis H. Lohr, St. Louis, Chairman of the Council, presiding.

Those present were: Drs. James R. McVay, Kansas City, President; Cyrus E. Burford, St. Louis, President-Elect; R. L. Thompson, St. Louis, Treasurer; A. S. Bristow, Princeton; Curtis H. Lohr, St. Louis; R. B. Denny, Creve Coeur; William A. Bloom, Fayette; A. J. Campbell, Sedalia; E. P. Heller, Kansas City; H. L. Kerr, Crane; Eldon C. Bohrer, West Plains, and Elam J. Nienstedt, Sikeston, Councilors; D. A. Robnett, Columbia; William E. Leighton, St. Louis; Titus S. Lapp, Fulton; Edwin C. Ernst, St. Louis, and E. Kip Robinson, Kansas City, members of the Committee on Cancer; E. H. Bartelsmeyer, St. Louis, Executive Secretary; W. D. Pipkin, Monroe City, and B. L. Murphy, Hannibal, President and Secretary of the Marion-Ralls County Medical Society, and Theodore R. Meyer, Clayton, Health Commissioner of St. Louis County, by invitation. The members of the State Cancer Commission present were Mr. Frank T. Hodgdon, Hannibal, Chairman; Dr. Fred. J. Taussig, St. Louis, Vice Chairman; Dr. Paul F. Cole, Springfield; Mr. William M. Clark, St. Joseph, and Miss Dorothy Hehmann, St. Louis, Executive Secretary.

After a thorough discussion of the policy of admission of indigent patients to the State Cancer hospitals, in order that there be full cooperation between the medical profession, the State Cancer Commission and the respective county courts in the administration of the laws to the benefit of all and that the excellent aims of the law not be abused, Dr. E. P. Heller, Kansas City, proposed the following resolution for the action of the Council:

*Resolved*, That it be the sense of this meeting, comprising the State Cancer Committee of the State Medical Association and the Council of the Association, that

1. The State Cancer Hospital now under construction at Columbia, Cancer Hospital No. 1 at Fulton and Cancer Hospital No. 2 at St. Joseph should accept for treatment only those cases which have passed through the social service filter locally, as the law provides.

2. That the Cancer Commission make known to the county judges at large in Missouri the presence in their communities of county medical society cancer committees who are available as consultants to the physician appointed by the court to diagnose and evaluate the suspected cancer cases.

3. That an administrator, properly qualified as a hospital executive, working in cooperation with the Commission and the local courts and cancer committees, will be amply able to determine the criterion for admission to the Cancer Hospital.

The resolution was unanimously adopted by the Council and submitted to the State Cancer Commission.

The State Cancer Commission immediately went into executive session and shortly thereafter informed the Council that the Commission had approved the resolution.

The State Cancer Commission expressed its appreciation to those present for the opportunity of discuss-

ing policies and methods in connection with the admission of patients to the State Cancer Hospitals. They pledged their cooperation to the medical profession and stated that they are in full accord with the profession in its position on charity abuse and efforts to keep ordinary medical and surgical cases out of these institutions.

The Council voted to join the St. Louis Medical Society in cordially inviting the American Medical Association to hold its 1943 Session in St. Louis.

### Meeting of November 26

The Council of the Missouri State Medical Association met in Kansas City at the University Club on Sunday, November 26, 1939, at 10:30 a. m., Dr. Curtis H. Lohr, St. Louis, Chairman, presiding.

In attendance were Drs. A. S. Bristow, Princeton; H. B. Goodrich, Hannibal; Curtis H. Lohr, St. Louis; R. B. Denny, Creve Coeur; W. A. Bloom, Fayette; A. J. Campbell, Sedalia; E. P. Heller, Kansas City; H. L. Kerr, Crane; E. C. Bohrer, West Plains; E. J. Nienstedt, Sikeston, Councilors; James R. McVay, Kansas City, President; Cyrus E. Burford, St. Louis, President-Elect; R. L. Thompson, St. Louis, Treasurer; Walter Baumgarten, St. Louis, Chairman, Committee on Publication; Morris B. Simpson, Kansas City, Chairman, Committee on Public Policy; James E. Stowers, Kansas City, Chairman, Committee on Scientific Work; C. H. Neilson, St. Louis, Chairman, Committee on Postgraduate Course; D. A. Robnett, Columbia, Chairman, Committee on Cancer; G. Wilse Robinson, Sr., Kansas City, Chairman, Committee on Mental Health; Ralph R. Wilson, Kansas City, Chairman, Committee on Maternal Welfare and Infant Care; H. L. Mantz, Kansas City, Adviser to Woman's Auxiliary; Morris Ginsberg, Kansas City, Chairman, Council Special Committee on Refugee Physicians; Harry F. Parker, Jefferson City, State Commissioner of Health; John Aull, Kansas City; W. M. West, Monett, and Paul Forgrave, St. Joseph, members State Board of Health; Theodore C. Meyer, Clayton, Commissioner of Health, St. Louis County; Mr. F. K. Helsby, Executive Secretary, Jackson County Medical Society, and E. H. Bartelsmeyer, St. Louis, Secretary of the Council.

The minutes of the meetings held on May 14 and June 11, 1939, were approved as published in THE JOURNAL.

The President, Dr. James R. McVay, and the President-Elect, Dr. Cyrus E. Burford, addressed the Council.

The President reported the appointment of Dr. F. G. Thompson, St. Joseph, as a member of the Committee on Cancer to fill the unexpired term (1940) of Dr. Titus S. Lapp, Fulton, resigned. The appointment was confirmed.

The Chairman appointed Drs. H. B. Goodrich, A. S. Bristow and E. C. Bohrer as the Committee on Appropriations.

The report of the Treasurer was received and referred to the Committee on Appropriations as follows:

### STATUS OF FUNDS

General Fund .....	\$2,930.77
Defense Fund .....	1,220.76
Public Relations Fund .....	1,561.99
Sinking Fund .....	4,269.00
Total .....	\$9,982.52

R. L. THOMPSON, Treasurer.

The report of the General Committee on Arrangements for the 1940 Joplin Session was submitted by Dr. H. L. Kerr, Chairman. The appointment of Dr. Paul W. Walker, Joplin, as Chairman of the Local Committee on Arrangements was confirmed.

The report of the Committee on Publication as submitted by Dr. Walter Baumgarten, Chairman, regarding the publication of THE JOURNAL was approved. Dr. Baumgarten was elected Editor of THE JOURNAL and Mr. Bartelsmeyer designated as Managing Editor.

The appointment of Dr. C. T. Ryland, Lexington, as a member of the Committee on Publication was approved. The Chairman, Dr. Lohr, was authorized to appoint the fifth member of the Committee.

The report of the Committee on Cancer was submitted by Dr. D. A. Robnett, Chairman, and approved. It was urged that county medical societies which had not appointed local committees on cancer do so at once and notify headquarters office of the personnel of the committee.

The report of the Committee on Scientific Work was submitted by Dr. James E. Stowers, Chairman, and approved. It was reported an excellent scientific program was being arranged for the Joplin (1940) Session and that eight distinguished guest speakers had already accepted an invitation to address its session.

The report of the Committee on Public Policy as submitted by Dr. Morris B. Simpson, Chairman, was approved. On recommendation of the Committee on Public Policy the following resolution was approved:

WHEREAS, It has come to the attention of the Committee on Public Policy that there is a great demand for speakers to address various lay organizations, and

WHEREAS, Speakers should be drawn from medical groups and from the Woman's Auxiliary, and

WHEREAS, These speakers should be specially trained, be it Resolved, That the Committee on Public Policy of the Missouri State Medical Association be given authority to cooperate with other interested committees of the Association, and its Auxiliary, to form, and if necessary train a group competent to make these talks to lay groups, and that as far as possible requests for speakers be referred to the Committee on Public Policy.

On recommendation of the Committee on Public Policy, the officers of the Association and the Committee on Public Policy were authorized to arrange two meetings of the presidents and secretaries of the component county medical societies at such times as may be determined.

The President, Dr. James R. McVay, reported the appointment of Drs. G. J. Tygett, Cape Girardeau; C. R. Bruner, Columbia, and C. Souter Smith, Springfield, as advisory members of the Committee on Conservation of Eyesight. The appointments were confirmed.

On recommendation of Dr. Bristow, Councilor of the First District, Atchison, Gentry, Nodaway and Worth counties were hyphenated into one Society.

The report of the Committee on Maternal Welfare and Infant Care was submitted by Dr. Ralph R. Wilson, Chairman, and approved.

The report of the Committee on Postgraduate Course was submitted by Dr. C. H. Neilson, Chairman, and approved.

The Chairman informed the Council of his recent association with the State Cancer Commission in the capacity of consultant for the purpose of assisting the Commission in the establishment of administrative rules, the organization of personnel and the formulation of policies affecting admissions to the new Cancer Hospital and requested an expression of an opinion from the Council. The Council, in unanimously endorsing this relationship, felt this a fortunate arrangement in that it would assure a mutual interchange of experience and thought which ultimately would reflect to the best interest of the patient, Commission and the members of the profession.

By invitation Dr. Harry F. Parker, State Commissioner of Health, and the members of the State Board of Health discussed with the Council various complaints and criticism received from component societies concerning programs sponsored by the Board of Health. This included the nine-point health program and the method in which federal and state funds are matched and allocated.

The Secretary reported the proceedings of the Annual Conference of Secretaries of Constituent State Medical Associations held in Chicago, November 17 and 18, and

discussed the eight point platform recently adopted by the American Medical Association.

Resolutions from the joint Committee on Professional Relations of the Medical Society of New Jersey protesting against the prescribing of medicine and the giving of medical advice over the radio with the exception of such broadcasts on health matters as are given under the auspices of recognized associations of licensed physicians or federal, state and local health departments, were endorsed and referred to the Chairman and Secretary of the Council for such action as they deemed advisable.

Activities of the American Federation of Women's Clubs with reference to the Wagner bill or similar measures were discussed and referred to Dr. H. L. Mantz, Kansas City, Adviser to the Woman's Auxiliary.

The action of the House of Delegates of the American Medical Association at the 1938 San Francisco session in its approval of the report of the Judicial Council of the American Medical Association relating to physicians and cultists was unanimously endorsed and the secretary instructed to communicate with the secretaries of the component societies with a request that the membership be informed of the Council's action. The report follows:

Many inquiries concerning the relations of the various cults to the regular profession have been received. The inquiries pertain particularly to the osteopath and the optometrist. Some of our members are giving lectures in osteopathic and optometric schools and addresses before their societies. Some members are associated by a common waiting room in offices with them. Some members are by mutual agreement professional associates principally in the field of surgery. There are some instances of partnership in practice. All of these voluntarily associated activities are unethical. Such relations certainly do not "uphold the dignity and honor of our vocation" or "exalt its standards." In case of emergency no doctor should refuse a sufferer knowledge or skill which he possesses to the sufferer's harm but this is quite a different matter from that of a consultant or practitioner who by consulting or practicing with him assists a cultist to establish himself as competent and on the same basis of medical knowledge as a doctor of medicine. By the very nature of the education and training of each, a consultation with a cultist is a futile gesture if the cultist is assumed to have the same high grade of knowledge, training and experience as is possessed by the doctor of medicine. Such consultation lowers the honor and dignity of the profession in the same degree to which it elevates the honor and dignity of the irregular in training and practice. Practicing as a partner or otherwise has the same effect and objection. Teaching in cultist schools and addressing cultist societies is even more reprehensible, for such activities give public approval by the medical profession to a system of healing known to the profession to be substandard, incorrect and harmful to the people because of its deficiencies. There hardly can be a voluntary relationship between a doctor of medicine and a cultist which is ethical in character.

The report of the Special Council Committee on Refugee Physicians was submitted by Dr. Morris Ginsberg, Chairman, and referred to the Committee on Public Policy.

On motion, the Council recommended to the House of Delegates that Dr. J. M. Russell, Monett, member of the Barry County Medical Society, be nominated for Affiliate Fellowship in the American Medical Association.

On motion the Council authorized a \$50 contribution to the Woman's Auxiliary to assist in defraying the expenses of the Essay Contest and convention expenses of the Auxiliary.

The Council accepted the invitation of Radio Station KFUV to broadcast a series of programs over this Station at such time as may be arranged for by the Council's Special Committee.

Cooperation with the Federal Trade Commission, Washington, D. C., in the matter of suits to restrain false and misleading advertising was approved.

On recommendation of the Committee on Appropriations the following budget for 1940 was approved:

#### REPORT OF THE COMMITTEE ON APPROPRIATIONS

To the Council:

Your Committee recommends the following as the Budget for 1940:



Salaries (Office and JOURNAL) .....	\$12,500.00
Printing of THE JOURNAL .....	7,000.00
Public Relations .....	2,000.00
Defense .....	1,000.00
Postage .....	700.00
Postgraduate Instruction .....	1,200.00
Printing and Stationery .....	700.00
Traveling Expenses of Executive Secretary .....	1,100.00
Telephone and Telegraph .....	600.00
Rent of Office and Light .....	1,200.00
Meetings:	
Annual Session .....	
Council and Councilors Expenses .....	
Committee Meetings and Conferences .....	3,000.00
Delegates to A. M. A. ....	
General Expense and Miscellaneous .....	750.00
	<hr/>
	\$31,750.00

CURTIS H. LOHR, Chairman.

The minutes of the Council meeting of April 29, 1940 (page 326) were read.

On motion, duly seconded, the report was adopted.

Dr. C. A. W. Zimmermann, Cape Girardeau, read the report of the Reference Committee on Constitution and By-Laws:

### REPORT OF THE REFERENCE COMMITTEE ON CONSTITUTION AND BY-LAWS

The Committee recommends the adoption of the proposed Constitution and By-Laws with the additional recommendation that Article XIII of the present Constitution be numbered Article IV and be appended to the proposed Constitution, making the proposed Constitution read as follows:

#### ARTICLE I—NAME

The name and title of this organization shall be the Missouri State Medical Association, and by such name shall have the right to contract and be contracted with, to plead and implead, to sue and be sued, and shall have the right to acquire, own, hold, mortgage and dispose of such real and personal property as shall be necessary for a proper maintenance and conduct of its affairs.

#### ARTICLE II—PURPOSES

The purposes of this Association shall be to bring into one compact organization the medical profession of the State of Missouri; to extend medical knowledge and advance medical science; to elevate the standards of medical education; to promote friendly intercourse among physicians; to safeguard the professional integrity of its members and to establish and maintain them in appropriate and equitable relationship with the public, with the government and with all agencies working in the field of health and welfare; and to enlighten and direct public opinion in regard to the problems of medicine and health for the best interest of the people of the state.

#### ARTICLE III

This Association shall have the right to enact By-Laws providing for the government, management and control of the Association.

#### ARTICLE IV—AMENDMENTS

The House of Delegates may amend any article of this Constitution by a two thirds vote of the delegates present and voting at any Annual Session, provided that such amendment shall have been presented in open meeting at the previous Annual Session and that it shall have been published twice during the year in THE JOURNAL of this Association or sent officially to each component society at least two months before the meeting at which final action is to be taken.

Following discussion by Drs. R. Emmet Kane, St. Louis; H. L. Mantz, Kansas City, and C. A. W. Zimmermann, Cape Girardeau, on motion duly seconded, the report was referred to the Committee on Constitution

and By-Laws and laid over until the next Annual Session.

Dr. Morris B. Simpson, Kansas City, read the report of the Reference Committee on Miscellaneous Affairs.

### REPORT OF THE REFERENCE COMMITTEE ON MISCELLANEOUS AFFAIRS

The Committee has considered carefully the verbal report of the Committee on Public Policy and recommends its approval.

On motion duly seconded, this report was adopted.

Dr. V. V. Wood, St. Louis, read the report of the Reference Committee on Medical Education and Public Welfare.

### REPORT OF THE REFERENCE COMMITTEE ON MEDICAL EDUCATION AND PUBLIC WELFARE

The Committee recommends the acceptance of the Report of the Committee on Maternal Welfare and Infant Care.

The Committee regards the report of the Committee on Rural Medicine as timely and recommends that it be referred to the Council for most careful consideration and that further study of these problems of rural medicine be carried on and active measures be instituted immediately to correct certain conditions pointed out by the report.

On motion, duly seconded, the report was adopted.

A plan of cooperation with the Farm Security Administration for medical care rendered patients of the Administration was discussed by Dr. W. H. Barron, Fredericktown, and on motion was referred to the Reference Committee on Medical Education and Public Welfare.

Dr. W. L. Allee, Eldon, moved that the Secretary be instructed to prepare proper resolutions of respect and sympathy to be sent to Mrs. B. W. Hays, Jackson, and resolutions of respect sent to Dr. E. J. Goodwin, St. Louis, and Dr. E. F. Yancey, Sedalia.

The motion was duly seconded and carried.

The President read the following letter from Mrs. B. W. Hays, Jackson:

Dear Dr. McVay:

I deeply appreciate your kind and thoughtful expression of sympathy. Please thank the Medical Association for me for the beautiful basket of flowers. I suppose Mr. Bartelsmeyer had them sent, so please thank him.

Dr. Hays had a heart attack Wednesday night but recovered enough to see patients Friday. He had another attack Saturday afternoon and one Sunday afternoon from which he never recovered. He became semi conscious and at times tried to talk about the meeting at Joplin.

Sincerely yours,

(Signed) Mrs. B. W. Hays.

On motion of Dr. R. Emmet Kane, St. Louis, a rising vote of sympathy was expressed for Mrs. Hays.

Dr. H. L. Mantz, Kansas City, offered the following resolution:

### Resolution on Committee on Medical-Military Affairs

WHEREAS, There are 556 Medical Reserve Officers on the active list in the State of Missouri, and

WHEREAS, A closer relationship between the Medical Reserve Officers of Missouri and the Association would be of mutual benefit in promoting the ethical practice of medicine and national defense and many other medical-military problems, and

WHEREAS, The experience of a sister association, the Iowa State Medical Society, has proven beneficial to both the Association and the Medical Reserve Officers of the state, therefore be it

Resolved, That the President be authorized to appoint a special committee of five members to be known as the Medical-Military Affairs Committee, the duty of which shall be to establish a closer relationship between

the Medical Reserve Officers of Missouri and this Association.

On motion, duly seconded, the resolution was adopted.

Dr. H. L. Mantz, Kansas City, offered the following resolution:

#### Resolution on Cooperation in Public Health Activities

WHEREAS, Due to the allocation of federal funds, there has been a great extension of the program and activity of the Department of Health of Missouri, and

WHEREAS, This enlarged program involves the private practice of medicine and the success and future of this program is of great importance to the citizens of Missouri, and

WHEREAS, There has been much confusion in the co-operation of the various agencies in the application of these activities, be it

*Resolved*, That a special committee of five members be appointed by the President of the Missouri State Medical Association to serve one year. The duties of this committee shall be to make a thorough study of the proposed plans and present activities of the Health Department of the State of Missouri and report their findings to the Council and House of Delegates. This committee shall also make such recommendations as appear to them necessary to develop a further degree of cooperation between the Missouri State Medical Association, the State Department of Health, local governmental agencies and private physicians so that any activities now in force or contemplated may be carried out to the best interests of all concerned.

On motion, duly seconded, this resolution was referred to the Reference Committee on Resolutions.

Dr. R. Emmet Kane, St. Louis, invited the Association to meet in St. Louis in 1941. The invitation was unanimously accepted.

On motion, duly seconded, the House of Delegates adjourned.

#### Wednesday, May 1, 1940—Afternoon Session

The House of Delegates convened at 4:00 p. m., May 1, with Dr. M. Pinson Neal, Columbia, Speaker of the House, presiding.

The Committee on Credentials reported five officers, eight Councilors and ninety-nine delegates registered.

The minutes of the previous meetings were read and on motion approved.

#### Nomination for President-Elect

Dr. O. P. Hampton, St. Louis, nominated Dr. Robert B. Denny, Creve Coeur, for President-Elect.

Dr. G. B. Mitchell, Branson, stated that he had intended to nominate Dr. H. L. Kerr, Crane, as President-Elect, but at the request of Dr. Kerr was not making the nomination.

Dr. J. D. James, Springfield, nominated Dr. R. M. James, Joplin, for President-Elect.

The ballot was cast and on count Dr. Robert B. Denny received 49 votes, Dr. R. M. James 21 votes.

The Speaker announced that Dr. Robert B. Denny, Creve Coeur, had been elected President-Elect.

The President-Elect was escorted to the platform by Drs. J. F. Harrison, Mexico, and Dr. Curtis H. Lohr, St. Louis.

DR. ROBERT B. DENNY, Creve Coeur: Mr. Speaker, Mr. President, Members of the Missouri State Medical Association: I desire to thank you for the honor you have conferred upon me by electing me your President-Elect. It is, indeed, an honor to be President-Elect and President of as great an organization as the Missouri State Medical Association. I have worked in this Association for a number of years and have taken great interest in it. I realize that with this honor there comes work and responsibility. Looking over the list of Past

Presidents, our present President and the one to be installed today, I wonder if I am capable of transacting and carrying on the business following them. If I thought I could make as good a President as Dr. McVay and others whom I have known personally, I certainly would be pleased.

#### Report of the Committee on Nominations

For Vice Presidents: Drs. L. J. Schofield, Warrensburg; Dr. William J. Stewart, Columbia, and Dr. Paul W. Walker, Joplin.

For Delegates to the American Medical Association: For Delegate, Dr. A. R. McComas, Sturgeon; alternate, Dr. E. Lee Miller, Kansas City. Delegate, Dr. H. L. Kerr, Crane; alternate, Dr. A. S. Bristow, Princeton.

On motion, duly seconded, these officers were declared elected.

The Secretary reported the results of the election of Councilors as follow:

1st District....Dr. A. S. Bristow, Princeton  
3rd District....Dr. Curtis H. Lohr, St. Louis  
5th District....Dr. W. A. Bloom, Fayette  
7th District....Dr. F. I. Wilson, Kansas City  
9th District....Dr. E. C. Bohrer, West Plains

#### Installation of Dr. Cyrus E. Burford

Dr. Cyrus E. Burford, St. Louis, was escorted to the platform by Drs. Herbert S. Langsdorf and Curtis H. Lohr, St. Louis.

DR. CYRUS E. BURFORD, St. Louis: I want to tell you how highly I value this honor—more than anything that has ever come to me in the past and I would be unwilling to accept it if I did not have the hearty co-operation of the members and officers of the Association whom I have been meeting in the last year. They have shown every indication of a helpful spirit and with such cooperation I shall do everything possible for better medicine and better health in Missouri. Of course we all make mistakes but I want you to know that I have high ideals in mind and if we can only keep up the splendid work that has been started in the last few years, which I think shows an upward movement in the medical profession of this state, I will feel that I have filled my position as well as could be expected. Gentlemen, I thank you.

Dr. Cyrus E. Burford, St. Louis, made the following appointments to committees:

Scientific Work: J. E. Stowers, Kansas City; Dudley S. Conley, Columbia; Stanley P. Howard, Jefferson City.

Postgraduate Course: M. Pinson Neal, Columbia; G. T. Bloomer, St. Joseph.

Public Policy: R. Emmet Kane, St. Louis; Associate Members, E. D. James, Joplin; Donald M. Dowell, Chillicothe.

Defense: O. B. Zeinert, St. Louis; L. P. Forgrave, St. Joseph.

Medical Education and Hospitals: Goronwy O. Broun, St. Louis; Sam. B. Grantham, Joplin.

Cancer: William E. Leighton, St. Louis; F. G. Thompson, St. Joseph.

Medical Economics: E. L. Johnston, Concordia; C. A. W. Zimmermann, Cape Girardeau.

Mental Health: B. Landis Elliott, Kansas City; Frank E. Grogan, St. Louis.

Maternal Welfare and Infant Care: E. Lee Dorsett, St. Louis; John Aull, Kansas City; Associate Members, Irl B. Krause, Jefferson City; W. Roger Moore, St. Joseph.

Health and Public Instruction (McAlester Foundation): E. Lee Miller, Kansas City; Frank G. Nifong, Columbia; Victor E. Scherman, St. Louis; Associate Members, D. A. Robnett, and A. J. Durant, V.M.D., Columbia.

Constitution and By-Laws: Floyd H. Spencer, St. Joseph; Otto W. Koch, St. Louis; Herbert S. Langsdorf, St. Louis; Herbert L. Mantz, Kansas City.



Fractures: Frank D. Dickson, Kansas City; James D. Horton, Springfield.

Conservation of Eyesight: Winfred L. Post, Joplin; Philip S. Luedde, St. Louis; Robert S. Minton, St. Joseph; Associate Members, George A. Hornback, Hannibal; G. J. Tygett, Cape Girardeau; Claude R. Bruner, Columbia; C. Souter Smith, Springfield.

Control of Venereal Disease: G. V. Stryker, St. Louis; V. Rogers Deakin, St. Louis.

Industrial Health: E. C. Funsch, St. Louis; J. E. Castles, Kansas City; W. M. Kinney, Joplin; H. I. Spector, St. Louis; G. T. Bloomer, St. Joseph.

Physical Therapy: William J. Stewart, Columbia; John L. Washburn, Versailles.

Study of Medical Practice Laws: J. Milton Singleton, Kansas City; Lee D. Cady, St. Louis; T. W. Cotton, Van Buren; E. D. James, Joplin; O. B. Gebhart, Oregon; M. Pinson Neal, Columbia; E. L. Spence, Kennett.

Medical Legal Affairs: Downey Harris, St. Louis.

Tuberculosis: E. E. Glenn, Springfield; George D. Kettelkamp, Koch; R. H. Runde, Mt. Vernon.

Rural Medicine: H. A. Lowe, Springfield; T. W. Cotton, Van Buren; James A. Logan, Warsaw.

Medical Military Affairs: W. J. Shaw, Fayette; Charles D. Osborne, Sedalia; D. D. Stofer, Kansas City; James E. Stowers, Kansas City; W. E. Stone, Boonville.

Adviser to Woman's Auxiliary: H. L. Mantz, Kansas City.

The President pointed out that of the new appointees thirty-eight were out-state members and eighteen were from the two larger cities, making a total on the committees of sixty-four members from out-state and forty-nine from the larger cities.

On motion, duly seconded, these appointments were approved.

Dr. J. C. Peden, St. Louis, reported for the Reference Committee on Medical Education and Public Welfare as follows:

## REPORT OF THE REFERENCE COMMITTEE ON MEDICAL EDUCATION AND PUBLIC WELFARE

A medical care plan for Farm Security Administration families in Madison County was referred to your Committee for consideration.

In the report of the Committee on Medical Economics submitted to and accepted by the House of Delegates at its first session Monday, we find the following:

"During the last year many county medical societies have studied and some have adopted the 'Pooling System' in caring for the clients of the Farm Security Administration. The Committee has not officially approved any of these plans because the House of Delegates of the Missouri State Medical Association has not adopted any type of prepayment medical plan. The Committee merely has given assistance from the large amount of data in its files. The Committee feels the House of Delegates should give consideration and study to these plans."

At the 1937 Cape Girardeau Session the House of Delegates authorized county medical societies to cooperate with this federal agency at their own election or discretion. The following By-Law was adopted at the 1936 Session:

"Chapter XI, Section 11. The State Association, or a county society in manner approved by the State Association, may undertake and coordinate all sickness, care of indigents and low income groups through agreements with public officials, and with physicians and others and by the use of contributions, cooperative funds and other means, provided only that free choice of physicians within such agreements shall be retained and that responsibility of physician to patient and all other agreements and tort relationships with patient shall remain as though the dealings were direct between physician and patient."

We quote the following paragraph from the report of

the Committee on Legislative activities of the American Medical Association made at the 1939 St. Louis Session:

"County plans for medical care are in operation in fifty-six of the seventy-five counties in Arkansas, twelve counties in Missouri, forty in Mississippi, twelve in Texas, twenty-six in Alabama, eighty-five in Georgia, seven in Ohio, five in Tennessee, two in Indiana, seven in Oklahoma, three in Iowa, four in New Mexico, three in Virginia, six in North Carolina, twelve in South Carolina, one in Montana, two in Idaho, fifteen in Louisiana, one in New Jersey and four in Florida, and plans have been made in some other states."

Your Committee feels that the plan submitted to us is in accord with the By-Laws of our Association. Further, we are informed the great majority of the plans now in operation in other states, as reported by the Committee on Legislative Activities of the American Medical Association referred to, operate on the pool plan. We therefore recommend that cooperation by and between the Farm Security Administration and county medical societies in providing medical care for clients of this Administration remain the responsibility and at the discretion of each respective county medical society of our Association, this action being in harmony with the authorization given by the House of Delegates at the Cape Girardeau Session. In order to secure uniformity of plans as may be adopted by the county medical societies at their election, it is recommended that county societies submit all such proposed plans to the State Association in accordance with the By-Law referred to.

On motion, duly seconded, the report was adopted.

Dr. H. L. Mantz, Kansas City, requested the unanimous consent of the House of Delegates to present a resolution, which was granted, and the following resolution was presented:

### Resolution on Conservation of Eyesight

WHEREAS, The Committee on Conservation of Eyesight of the Missouri State Medical Association recognizes the need of an educational program throughout the country, and

WHEREAS, The Committee believes that the term "Conservation of Eyesight" carries broader implications than "Prevention of Blindness," and

WHEREAS, The Committee believes that other state medical associations should form similar committees, therefore be it

*Resolved*, That the Missouri State Medical Association requests the inauguration of such an educational program by the American Medical Association, and be it further

*Resolved*, That the Delegates from the Missouri State Medical Association to the American Medical Association be instructed to offer a resolution in the House of Delegates of the American Medical Association to the effect that a Committee on Conservation of Eyesight be formed as a committee of the American Medical Association to extend the educational program and to encourage the formation of such state committees.

On motion, duly seconded, the resolution was adopted.

The report of the Reference Committee on Resolutions, Dr. R. Emmet Kane, St. Louis, Chairman, follows:

## REPORT OF THE REFERENCE COMMITTEE ON RESOLUTIONS

The Committee recommends that the resolution introduced by Dr. H. L. Mantz, Kansas City, regarding cooperation in Public Health Activities be adopted.

On motion, duly seconded, the report was adopted.

The following resolution, on motion duly seconded, was adopted:

The House of Delegates of the Missouri State Medical Association, in the final session of their 83rd Annual

Session, desires to express to the press, to the Connor Hotel, to the City of Joplin and to the Jasper County Medical Society their whole hearted gratitude for the hospitality accorded them and for the efficient handling of the Session.

On motion the House of Delegates adjourned *sine die*.

## MEETING OF THE COUNCIL

Hotel Connor, Joplin

Monday, April 29, 1940—First Session

The first meeting of the Council convened at a luncheon meeting at noon, April 29, 1940, the Chairman, Dr. Curtis H. Lohr, St. Louis, presiding.

Roll call showed the following Councilors and Officers present:

1st District.....A. S. Bristow, Princeton  
3rd District.....Curtis H. Lohr, St. Louis  
4th District.....R. B. Denny, Creve Coeur  
5th District.....W. A. Bloom, Fayette  
6th District.....A. J. Campbell, Sedalia  
7th District.....E. P. Heller, Kansas City  
8th District.....H. L. Kerr, Crane  
9th District.....E. C. Bohrer, West Plains  
President.....James R. McVay, Kansas City  
President-Elect.....Cyrus E. Burford, St. Louis  
Treasurer.....R. L. Thompson, St. Louis  
Editor.....Walter Baumgarten, St. Louis  
Executive Secretary E. H. Bartelsmeyer, St. Louis

The minutes of the meeting of November 26, 1939, were read and approved.

On motion, duly seconded, the message of the President was approved.

On motion, the Chairman of the Council was authorized to appoint a committee of three councilors to formulate a social security plan, or retirement fund, for the employees in the Association's headquarters office, the Executive Secretary to be an ex-officio member of the committee and report back to the Council.

On motion, duly seconded, the report of the Executive Secretary was approved.

Dr. Curtis H. Lohr, St. Louis, Chairman, appointed an Auditing Committee as follows: Drs. E. C. Bohrer, West Plains; R. B. Denny, Creve Coeur; A. J. Campbell, Sedalia.

On motion, the report of the Treasurer was referred to the Auditing Committee.

The following candidates for Affiliate Fellowship in the American Medical Association were approved: Drs. Herschel W. Lancaster, Nevada; Leroi Beck, St. Joseph; Hasbrouck DeLamater, St. Joseph; J. H. Laning and James Y. Simpson, Jackson County.

The following telegram from Dr. Olin West, Secretary of the American Medical Association, was read:

"Senate Committee on Education and Labor will submit revised Wagner-George Hospital Bill today. Am informed that several suggestions for amendment to original bill proposed by representatives of A. M. A. and National Hospital Association are included in revised bill. Will send copy of new bill as soon as official copies are available."

On motion, the matter of cooperation between the Missouri Press Association and our Association in furnishing and distributing medical information, or health releases, to the rural press was referred to the Committee on Publication.

Individual Councilors reported on the status of the societies in their respective districts.

On motion the Council adjourned.

Wednesday, May 1, 1940—Second Meeting

The second meeting of the Council convened May 1 following the final meeting of the House of Delegates with Dr. Curtis H. Lohr, St. Louis, presiding.

Roll call showed the following Councilors and Officers present:

1st District.....A. S. Bristow, Princeton  
3rd District.....Curtis H. Lohr, St. Louis  
4th District.....R. B. Denny, Creve Coeur  
5th District.....W. A. Bloom, Fayette  
6th District.....A. J. Campbell, Sedalia  
7th District.....F. I. Wilson, Kansas City  
8th District.....H. L. Kerr, Crane  
9th District.....E. C. Bohrer, West Plains  
President.....C. E. Burford, St. Louis  
Executive Secretary E. H. Bartelsmeyer, St. Louis

The report of the Auditing Committee was read and approved.

The election of officers for the year resulted as follows: Treasurer, Dr. R. L. Thompson, St. Louis; Executive Secretary, Mr. E. H. Bartelsmeyer, St. Louis; Editor, Dr. Walter Baumgarten, St. Louis; Chairman of the Council, Dr. Curtis H. Lohr, St. Louis; Vice Chairman, Dr. W. A. Bloom, Fayette; Secretary of the Council, Mr. E. H. Bartelsmeyer, St. Louis.

The Committee on Publication was appointed as follows: Drs. Walter Baumgarten, St. Louis, Chairman; Richard B. Schutz, Kansas City; M. H. Shelby, Cape Girardeau; J. B. Lemmon, Springfield; Robert C. Haynes, Marshall.

On motion of Dr. W. A. Bloom, Fayette, the Secretary was instructed to write a letter of appreciation for the program to Dr. J. E. Stowers, Kansas City, Chairman of the Committee on Scientific Work.

On motion, the Committee on Scientific Work was authorized to invite a minimum of eight guest speakers for the 1941 Annual Session.

The resignation of Dr. R. B. Denny, Creve Coeur, as Councilor of the Fourth Councilor District, was accepted with regret. The Chairman was authorized to consult with the respective delegates representing the Fourth Councilor District and approve on behalf of the Council the individual recommended by the delegates to become Councilor to fill the unexpired term caused by the resignation of Dr. Denny.

Dr. Curtis H. Lohr, St. Louis, was appointed Chairman of the General Committee on Arrangements, Dr. Howard B. Goodrich, Hannibal, a member, and another member is to be appointed later.

On motion the Council adjourned *sine die*.

## COMMITTEE ON MATERNAL WELFARE AND INFANT CARE

Luncheon Meeting

Monday, April 29, 1940—Hotel Connor

The annual meeting of the Committee on Maternal Welfare and Infant Care was held in the Empire Room, Hotel Connor, Joplin, at 12:00 noon, April 29, Dr. Ralph R. Wilson, Kansas City, Chairman, presiding.

Dr. John W. Harris, Madison, Wisconsin, was a guest of the Committee and discussed maternal deaths reported at the meeting.

Taking part in reports and discussions were Drs. John W. Harris, Madison, Wisconsin; H. S. Dowell, Chillicothe; W. T. Stacy, St. Joseph; Irwin T. Craig, Joplin; J. F. Harrison, Mexico; C. D. Stratton, Rothville; E. Lee Dorsett, St. Louis; J. D. James, Springfield; M. O. Coombs, Joplin; Quitman U. Newell, St. Louis.

Dr. George M. Powell, Springfield, received the award for the best article on obstetrics appearing in *THE JOURNAL* during the year for his article on "Pregnancy and Diabetes," which appeared in the April 1940 issue in the symposium on "Maternal Welfare."

## DINNER IN HONOR OF PAST PRESIDENTS

The dinner in honor of Past Presidents was held on the Roof, Hotel Connor, Joplin, at 7:00 p. m., April 29,



the President, Dr. James R. McVay, Kansas City, presiding.

The following distinguished guests were introduced: Dr. R. M. James, Joplin, President, Jasper County Medical Society; Dr. Joseph W. Gale, Madison, Wisconsin; Dr. George W. Post, Chicago; Dr. Alfred I. Folsom, Dallas; Dr. Cyrus C. Sturgis, Ann Arbor; Mr. E. H. Bartelsmeyer, St. Louis, Executive Secretary; Mrs. Paul F. Cole, Springfield, President, Woman's Auxiliary; Dr. Cyrus E. Burford, St. Louis, President-Elect; Mr. C. P. Loran, Birmingham, Secretary, Southern Medical Association; Dr. Quitman U. Newell, St. Louis, President-Elect, Southern Medical Association.

Telegrams were read from Dr. C. C. Nesselrode, Topeka, Kansas, President of the Kansas State Medical Society; Dr. Rock Sleyser, Wauwatosa, Wisconsin, President, American Medical Association.

Dr. Nathan B. Van Etten, New York, President-Elect of the American Medical Association, was unable to be present because of illness.

Dr. Alphonse McMahon, St. Louis, Vice President, American Medical Association, spoke on "The Responsibilities and Aims of the American Medical Profession."

The President introduced the following Past Presidents: Drs. Dudley S. Conley, Columbia; Ross A. Woolsey, St. Louis; E. Lee Miller, Kansas City; C. T. Ryland, Lexington; W. Logan Allee, Eldon; J. F. Harrison, Mexico; T. W. Cotton, Van Buren; Frank I. Ridge, Kansas City; Frank G. Nifong, Columbia; W. H. Breuer, St. James; G. Wilse Robinson, Kansas City; A. R. McComas, Sturgeon, and Robert E. Schlueter, St. Louis.

A round table discussion of "Problems in the Practice of Medicine: How We Think They Should Be Solved" was participated in by Drs. Curtis H. Lohr, St. Louis, Chairman of the Council; Cyrus E. Burford, St. Louis, President-Elect; Herbert L. Mantz, Kansas City, Adviser, Woman's Auxiliary; Morris B. Simpson, Kansas City, Chairman, Committee on Public Policy.

## MINUTES OF THE GENERAL MEETING

### Roof, Hotel Connor

#### Monday, April 29, 1940—Afternoon Session

The scientific sessions were held in the Roof Ballroom of the Hotel Connor, Joplin, the first convening at 2:30 p. m., with Dr. James R. McVay, Kansas City, President, in the chair. Addresses were presented as follows:

Dr. Heyworth N. Sanford, Chicago, "Studies in Blood Coagulation Disturbances."

Dr. John H. Harris, Madison, "Pain Relief in Labor."

Dr. Louis A. Buie, Rochester, "Office and Hospital Management of Some Anorectal Disorders."

#### Tuesday, April 30, 1940—Morning Session

Dr. James R. McVay, Kansas City, Address of the President, "The Challenge Accepted."

Dr. Cyrus E. Burford, St. Louis, Address of the President-Elect, "Responsibility of Medical Care."

Dr. Robert Elman, St. Louis, "The Importance of Protein Replacement in the Treatment of Severe Burns."

Dr. Cyrus C. Sturgis, Ann Arbor, "The Prognosis and Treatment of Hypertension."

Dr. Alfred I. Folsom, Dallas, "The Role of the Female Urethra in Bladder Irritation in Women."

Dr. Cyrus M. MacBryde, St. Louis, "Advances in the Management of Diabetes."

Dr. Joseph W. Gale, Madison, "Acute Suppurative Pleurisy."

Dr. William H. Olmsted, St. Louis, "A Study of Diabetic Patients Under Observation for Ten Years With Special Reference to Arteriosclerosis."

#### Tuesday, April 30, 1940—Noon Session

##### Round Table Discussion, Empire Room, Hotel Connor

Dr. R. M. James, Joplin, presided.

Questions pertaining to surgery were answered by Dr. Joseph W. Gale, Madison; those pertaining to internal medicine by Dr. Cyrus C. Sturgis, Ann Arbor.

#### Tuesday, April 30, 1940—Afternoon Session

Dr. E. V. Mastin, St. Louis, "Some of the Hazards in the Treatment of Hyperthyroidism."

Dr. Alfred I. Folsom, Dallas, "Some Practical Considerations in the Treatment of Chronic Gonorrhea."

Dr. Frank D. Dickson, Kansas City, "Low Back Pain from the Orthopedic Point of View."

Dr. Cyrus C. Sturgis, Ann Arbor, "The Anemias of Pregnancy."

Dr. M. Pinson Neal, Columbia, "The Diagnosis of Pernicious Anemia."

Dr. Joseph W. Gale, Madison, "The Dynamics of Respiration." Motion picture.

Dr. Julius Jensen, St. Louis, "Heart Disease: Review of the Progress of a Decade."

Dr. B. Landis Elliott, Kansas City, "The Small Encephalogram."

#### Wednesday, May 1, 1940—Morning Session

Dr. Paul F. Fletcher, St. Louis, "The Application of Gynecological Endocrinology to General Practice."

Dr. Hubert M. Parker, Kansas City, "Undulant Fever."

Dr. Everett D. Plass, Iowa City, "Functional Menstrual Disturbances."

Dr. Herbert J. Rinkel, Kansas City, "Food Allergy."

Dr. George W. Post, Chicago, "The Importance of Water Balance and the Electrolytes in the Preoperative and Postoperative Care of Surgical Patients."

Dr. Ira H. Lockwood and Dr. Arthur B. Smith, Kansas City, "The Diagnosis of Renal Lesions."

Dr. John H. Musser, New Orleans, "Treatment of Some of the Contagious Diseases."

Dr. John M. Sartin, Springfield, "Treatment in the Anxiety States."

#### Wednesday, May 1, 1940—Noon Session

##### Round Table Discussion, Empire Room, Hotel Connor

Dr. H. A. Lowe, Springfield, presided.

Questions pertaining to surgery were answered by Dr. George W. Post, Chicago; on internal medicine by Dr. John H. Musser, New Orleans; on obstetrics and gynecology by Dr. Everett D. Plass, Iowa City, and on pediatrics by Dr. John Aull, Kansas City.

#### Wednesday, May 1, 1940—Afternoon Session

Dr. L. P. Engel, Kansas City, "Surgical Management of Hyperinsulinism."

Dr. John H. Musser, New Orleans, "Some Facts Concerning Coronary Vascular Diseases."

Dr. H. L. Alexander, St. Louis, "Intractable Asthma."

Dr. Everett D. Plass, Iowa City, "The Fibroid Uterus."

On motion the Eighty-third Annual Session of the Missouri State Medical Association adjourned *sine die*.

## REGISTRATION AT EIGHTY-THIRD ANNUAL SESSION

Adams, C. Frederick, Jefferson City  
Adler, Bernard C., Stockton  
Adler, Morton W., Vandalia  
Alberty, Omer L., Carl Junction

\* Visitor

Alexander, Harry L., St. Louis  
Allee, W. Logan, Eldon  
Amos, James R., Higginsville  
\*Andrews, K. R., St. Louis  
Asher, Arthur G., Kansas City

- \*Athy, Gregg B., Columbus, Kan.  
 Atkins, James A., Lamar  
 \*Atkinson, Richard M., Bentonville, Ark.  
 Aufranc, W. H., Jefferson City  
 Aull, John, Kansas City  
 Austin, Charles S., Carrollton  
 \*Badgett, J. F., St. Louis  
 \*Bagby, Harold J., Coffeyville, Kan.  
 Barnard, William C., Seneca  
 Barone, Paul L., Nevada  
 Barron, W. Harry, Fredericktown  
 Bartelsmeyer, E. H., St. Louis  
 Bartlett, Robert W., St. Louis  
 Bartlett, Willard, Jr., St. Louis  
 \*Bauer, H. W., New York, N. Y.  
 Baumgarten, Walter, St. Louis  
 Beattie, William R., Springfield  
 Beers, Ellsworth G., Seymour  
 Belden, Edgar A., Sikeston  
 \*Bell, Cleo D., Pittsburg, Kan.  
 \*Beyreuther, P. F., St. Louis  
 Bickel, Vern T., Lamar  
 Black, Mervin H., Joplin  
 Black, W. Byron, Kansas City  
 Blanke, Otto T., Joplin  
 Bloom, William A., Fayette  
 \*Boese, Adolph, Coffeyville, Kan.  
 Bohrer, Eldon C., West Plains  
 Bourke, Timothy S., Kansas City  
 Bowman, M. C., Neosho  
 \*Brady, C. S., Kansas City  
 Braecklein, William A., Higgsville  
 Brams, Jack B., Kansas City  
 Brasher, Ben H., Lexington  
 \*Breckenkamp, A. W., St. Louis  
 Breckenridge, Elmer O., Maplewood  
 Bredall, Jerome J., Perryville  
 Breuer, Robert E., Newburg  
 Breuer, William H., St. James  
 Bristow, Arthur S., Princeton  
 Brooks, John M., Golden City  
 Broun, Goronwy O., St. Louis  
 \*Brown, Charles S., St. Louis  
 Brown, Eugene R., University City  
 Broyles, Watkins A., Bethany  
 Brumm, Lawrence W., Kansas City  
 Bruner, Claude R., Columbia  
 \*Buck, S. Bernice, Anderson  
 Buckingham, W. W., Kansas City  
 Buhler, Victor B., Kansas City  
 \*Buie, Louis A., Rochester, Minn.  
 Bull, Ben M., Ironton  
 Burford, Cyrus E., St. Louis  
 Burney, Wallace S., Miller  
 Burton, William H., Van Buren  
 Butler, Fred E., Salem  
 Byrd, Homer E., Carthage  
 Byrne, John I., St. Joseph  
 Callaway, Guy D., Springfield  
 Callihan, C. F., Willow Springs  
 Camp, Francis B., Springfield  
 Campbell, A. J., Sedalia  
 Capell, Clarence S., Kansas City  
 Cardwell, Clarence, Stella  
 Carlson, H. E., Kansas City  
 Carmichael, Francis A., Sr., St. Joseph  
 Castles, John E., Kansas City  
 Chambers, James Q., Jr., Kansas City  
 Chapman, James W., Jefferson City  
 Chenoweth, J. Albert, Joplin  
 \*Chesnut, W. G., Miami, Okla.  
 Clark, Samuel M., Halltown  
 \*Cleary, Leo A., St. Joseph  
 Cline, Edward W., Ozark  
 Coffelt, Kenneth C., Springfield  
 Coffey, Ralph R., Kansas City  
 Cole, Paul F., Springfield  
 \*Colvert, George W., Miami, Okla.  
 Comboy, Lawrence J., Independence  
 Conley, Dudley S., Columbia  
 \*Conley, James G., Pittsburg, Kan.  
 Cook, Emmett F., St. Joseph  
 Cook, Thomas F., Richmond  
 Coombs, Miller O., Joplin  
 Cooper, Elven R., Warrensburg  
 Cope, Josef S., Lexington  
 Copette, Alex P., Crane  
 Cotton, T. W., Van Buren  
 Counsell, Chester M., Kansas City  
 Cox, Kenneth E., Kansas City  
 Craig, Irwin T., Joplin  
 \*Craig, James W., Miami, Okla.  
 \*Craig, Paul E., Coffeyville, Kan.  
 \*Cramblet, L. H., Bloomfield, N. J.  
 Cremer, William J., Nevada  
 Crews, Robert N., Fulton  
 Danglede, James H., Kansas City  
 Davis, C. B., Nevada  
 Davis, Charles B., Walker  
 Davis, Frank L., St. Louis  
 Davis, Harry H., Rolla  
 Dawson, John W., Eldorado Springs  
 Day, Anthony B., St. Louis  
 \*DeArman, M. M., Miami, Okla.  
 Denny, Robert B., Creve Coeur  
 DeTar, Burleigh E., Joplin  
 \*DeTar, George A., Miami, Okla.  
 \*Devilbiss, E. F., Kansas City  
 Dewey, James E., Springfield  
 Dickson, Frank D., Kansas City  
 Diveley, Rex L., Kansas City  
 Dixon, John R., Linneus  
 Dorsett, E. Lee, St. Louis  
 \*Dorsey, J. W., Kansas City  
 Douglass, Jesse E., Webb City  
 Dowell, George S., Braymer  
 \*Doyle, G. D., New York  
 Duckett, Claude E., Lamar  
 Duckett, Thomas G., Sheldon  
 Duemler, Thomas B., Seneca  
 Dumbauld, B. A., Webb City  
 Duncan, Ralph E., Kansas City  
 Dyer, Clyde P., St. Louis  
 \*Eberhardt, L. R. C., Akron, Ohio  
 Eberhardt, Theodore P., Columbia  
 Edmondson, John L., Stella  
 Elam, William T., St. Joseph  
 Eldridge, Charles J., Kansas City  
 Elkins, Ronald F., Springfield  
 Elliott, B. Landis, Kansas City  
 Ellis, Coburn, Sweet Springs  
 Elman, Robert, St. Louis  
 Engel, Lawrence P., Kansas City  
 Engman, Martin F., Jr., St. Louis  
 Ergas, José S. A., Springfield  
 \*Erickson, C. W., Pittsburg, Kan.  
 Farthing, Fred R., Springfield  
 Farthing, Robert R., Ozark  
 \*Faye, James, Kansas City  
 Feller, C. E., Springfield  
 Fessenden, Ersel M., Springfield  
 Finley, Freeman L., Overland  
 \*Flaherty, James V., Stockton  
 Fletcher, Paul F., St. Louis  
 Flynn, Charles H., Tarkio  
 \*Folsom, Alfred L., Dallas, Texas  
 \*Fortner, Charles H., Coffeyville, Kan.  
 Freeman, Samuel F., Springfield  
 Frick, John P., Kansas City  
 Frieheit, Harold J., Fredericktown  
 \*Fuller, Clinton C., Columbus, Kan.  
 Gaddie, William R., Duenweg  
 \*Gale, Joseph W., Madison, Wis.  
 \*Gamet, Joseph H., Rolla  
 Gashwiler, J. S., Novinger  
 Gentry, Marvin C., Ava  
 Gentry, Merritt L., Osceola  
 Gilkey, Harry M., Kansas City  
 Glenn, Elmer E., Springfield  
 Glover, Kenneth, Mt. Vernon  
 Goldberg, Isadore E., Polo  
 Goodson, William H., Liberty  
 Grace, Haynie M., Chillicothe  
 Gradwohl, R. B. H., St. Louis  
 Grantham, Samuel A., Joplin  
 Gray, John M., Chitwood  
 Gregg, Arthur M., Joplin  
 Gunn, William G., Versailles  
 Hall, Oscar B., Warrensburg  
 Halsey, Thomas J., Butler  
 Hamilton, Buford G., Kansas City  
 Hammond, John J., St. Louis  
 Hampton, Oscar P., Jr., St. Louis  
 Hanna, Minford A., Kansas City  
 Hansel, French K., St. Louis  
 Hansen, Arthur L., Appleton  
 Hanss, Armand W., Springfield  
 Hardy, Joseph A., Jr., St. Louis  
 Hargrove, Fred T., Monett  
 Harrell, Roosevelt E., Bufalo  
 \*Harris, John W., Madison, Wis.  
 Harris, Maxwell J., Carthage  
 Harris, Russell D., Carthage  
 Harrison, J. F., Mexico  
 Hart, P. V., Coatesville  
 Harwell, J. Lee, Poplar Bluff  
 Hawkins, Wesley R., Glasgow  
 Haynes, Robert C., Marshall  
 Hayward, John D., Clayton  
 H'Doubler, Francis T., Springfield  
 Heller, E. P., Kansas City  
 \*Helsby, F. K., Kansas City  
 Helwig, Ferdinand C., Kansas City  
 Henderson, James P., Kansas City  
 Henry, Clifford E., Kirksville  
 \*Heslin, A. T., Kansas City  
 Hess, H. Lewis, Kansas City  
 \*Hetherington, Lloyd P., Miami, Okla.  
 Higgins, Clinton K., St. Louis  
 Hines, Paul, Webster Groves  
 Hoctor, Emmett F., Farmington  
 Hogan, Frank E., Mound City  
 Hogeboom, George W., Springfield  
 Hogg, Garrett S., Jr., Cabool  
 Holmes, P. A., Mt. Vernon  
 \*Holzapfel, Paul, Lynchburg, Va.  
 Hopkins, Thomas A., Nevada  
 Horne, Albert H., Steelville  
 Horst, Otto C., Springfield  
 Horton, James D., Springfield  
 Howard, Stanley P., Jefferson City  
 \*Howard, Walter A., Chelsea, Okla.  
 \*Howerton, Roy, Indianapolis, Ind.  
 Hunt, Paul F., Kansas City  
 \*Huser, S. J., Joplin  
 Hyndman, Charles E., St. Louis  
 Isbell, Charles H., Jasper  
 \*Jacoby, J. Sherwood, Commerce, Okla.  
 \*Jaenicke, Kurt, Clinton, Iowa  
 James, Ed. D., Joplin  
 James, Joseph D., Springfield  
 James, Robert M., Joplin  
 Jensen, Julius, St. Louis  
 Jessell, C. Todd, Higgsville  
 Johnston, Albert S., Wheatland  
 Johnston, Elza L., Concordia  
 Jones, Andrew B., St. Louis  
 Kane, R. Emmet, St. Louis  
 \*Keelan, Harry S., New York, N. Y.  
 Kelly, Thomas J., Jefferson City  
 Kennedy, R. W., Marshall  
 Kerr, Frank T., Monett  
 Kerr, Homer L., Crane  
 Kerr, Russell W., Kansas City  
 Kinney, William M., Joplin  
 Kitchen, William B., Glasgow  
 \*Kleinschmidt, L. S., Columbia  
 Klepinger, Dayton P., Kansas City  
 \*Knight, J. Hugh, St. Louis  
 Koch, Otto W., St. Louis  
 Koon, Bernard T., Perryville  
 Korth, William M., Kansas City  
 Kuhn, John R., Jr., Joplin  
 LaForce, Herman A., Joplin  
 \*Lakaytis, C. A., Kansas City  
 Lamar, Frederick C., Kansas City  
 Lamson, Roy C., Neosho  
 Langsdorf, H. S., St. Louis  
 Lau, Gustav A., St. Joseph  
 \*Lazar, M. R., St. Louis  
 Lee, Chester E., Kansas City  
 Leighton, William E., St. Louis  
 Leitch, Cecil G., Kansas City  
 LeMone, David V., Columbia  
 \*Lightfoot, Earl C., Girard, Kan.  
 Lilly, Terry E., Kansas City  
 Lindquist, Carl N., Kansas City  
 Lockwood, Ira H., Kansas City  
 Lohr, Curtis H., St. Louis  
 Long, David S., Harrisonville  
 \*Loranz, C. P., Birmingham, Ala.  
 Loveland, William S., Joplin  
 \*Low, Joseph H., Coffeyville, Kan.  
 Lowe, Horace A., Springfield  
 Luedde, Philip S., St. Louis



- Lusk, Charles A., Jr., Butler  
\*Lyon, C. H., Kansas City  
Lyons, L. Mason, Pierce  
City  
McAlester, A. W., Jr., Kan  
sas City  
McBurney, C. A., Slater  
McCaughan, John M., St.  
Louis  
McComas, A. R., Sturgeon  
McComb, James A., Leba-  
non  
\*McCool, E., Joplin  
McCormick, F. L., Moberly  
McGaughey, Hugh D., Jop-  
lin  
McIntire, Emery J., Car-  
thage  
McIntyre, W. Kress, St.  
Louis  
\*McKinney, William, Baxter  
Springs, Kan.  
McMahon, Alphonse, St.  
Louis  
McNew, William T., Car-  
thage  
McVay, James R., Kansas  
City  
MacBryde, Cyril M., St.  
Louis  
Mack, Mary L., Joplin  
Macnish, James M., St. Louis  
Maddox, John D., Joplin  
Mallette, Cyrus, Crocker  
Maness, Charles E., Neosho  
Mantz, Herbert L., Kansas  
City  
Martin, Forrest L., Nevada  
\*Martz, Del. St. Louis  
\*Mastin, Edward V., St. Louis  
Mays, Frank G., Washing-  
ton  
Meinershagen, C. W., Webb  
City  
\*Melaske, J. F., Wichita,  
Kan.  
Mellies, Chester J., Mt. Ver-  
non  
Miller, Charles W., St. Louis  
Miller, E. Lee, Kansas City  
Miller, Thomas F., Lamar  
\*Mitchell, E., Goodman  
Mitchell, Guy B., Branson  
\*Montgomery, C. C., Kansas  
City  
Montgomery, James G.,  
Kansas City  
Moore, Neil S., St. Louis  
\*Moore, Raymond W., Eu-  
reka, Kan.  
\*Morris, Mary Margaret,  
Webb City  
Mueller, Robert, St. Louis  
Muether, Raymond O., St.  
Louis  
Mulliniks, Edward C.,  
Springfield  
Murray, Lotis V., Pleasant  
Hill  
Musick, James D., Spring-  
field  
\*Musser, John H., New Or-  
leans, La.  
\*Mussman, R. W., Columbia  
Myers, George T., Macks  
Creek  
Myers, Roy E., Joplin  
Neal, M. Pinson, Columbia  
Neff, Robert L., Joplin  
Neilson, Charles H., St.  
Louis  
Nelson, Charles S., Kansas  
City  
Nelson, James M., Kansas  
City  
Newell, Quitman U., St.  
Louis  
Newkirk, Richard C., Joplin  
\*Newman, Carl S., Pittsburg,  
Kan.  
Newman, George W., Cass  
ville  
Nifong, Frank G., Columbia  
Nixon, Edward E., Gallatin  
\*Nonnenkamp, Dorothy,  
Webb City  
Norman, Robert M., Ava  
Northcutt, Mary Jane, Cass-  
ville  
Ockerblad, Nelse F., Kan-  
sas City  
O'Connell, John, Overland  
Oliver, Everett A., Richland  
Olmsted, William H., St.  
Louis  
\*Oppenheimer, H. E., St.  
Louis  
O'Rourke, Paul V., Kansas  
City  
Osborne, Charles D., Se-  
dalia  
Overholser, Milton D., Co-  
lumbia  
Owens, James F., Spring-  
field  
\*Pack, O. G., Racine, Wis.  
Padgett, Earl C., Kansas City  
\*Palmer, B. C., Kansas City  
Parker, Harry F., Warrens-  
burg  
Parker, Hubert M., Kansas  
City  
\*Parrish, William A., Pitts-  
burg, Kan.  
\*Peacock, Arthur L., Gentry,  
Ark.  
Peden, Joseph C., St. Louis  
\*Pickerell, A. G., Joplin  
\*Pigford, Russell C., Tulsa,  
Okla.  
Pipkin, Garrett, Kansas City  
\*Plass, Everett D., Iowa City,  
Iowa  
Poor, Carl W., Joplin  
\*Post, George W., Chicago,  
Ill.  
Post, Winfred L., Joplin  
\*Poston, C. L., Joplin  
Potter, Reese, Nevada  
Powell, George M., Spring-  
field  
Powers, Everett, Carthage  
Powers, John A., Warrens-  
burg  
\*Prater, M. C., Indianapolis,  
Ind.  
Pritchett, Paul L., Webb  
City  
Quistgard, Paul C., Kansas  
City  
Rainwater, E. H., Spring-  
field  
Randall, Leslie C., Licking  
Rassieur, Louis, St. Louis  
\*Rea, Joseph G., Kansas City  
\*Read, P. W., Kansas City  
Reid, Charles T., Joplin  
\*Rein, Fred H., St. Louis  
\*Reynolds, C. A., New York,  
N. Y.  
Reynolds, James R., Neosho  
Ridge, Frank I., Kansas City  
Rigney, Levi M., Springfield  
\*Rinehart, William G., Pitts-  
burg, Kan.  
Rinkel, Herbert J., Kansas  
City  
\*Rinker, Miss, Joplin  
Roberts, Joseph F., Bolivar  
Robichaux, Eugene B., Ex-  
celsior Springs  
Robinson, G. Wilse, Jr.,  
Kansas City  
Robinson, G. Wilse, Sr.,  
Kansas City  
Robnett, Dudley A., Colum-  
bia  
Rolens, Louis E., Granby  
Roseberry, Eugene C.,  
Springfield  
Rosenthal, Frances E., Jop-  
lin  
Ross, Pren J., Grant City  
Runde, R. H., Mt. Vernon  
Russell, D. R., Kansas City  
\*Russell, Richard, Picher,  
Okla.  
\*Ryan, Mrs., St. Louis  
Ryland, C. T., Lexington  
\*Sample, C. S., Jr., Spring-  
field  
\*Sanford, Heyworth N., Chi-  
cago, Ill.  
Sartin, John M., Springfield  
Scherman, Victor E., St.  
Louis  
Schlueter, Robert E., St.  
Louis  
Schmidt, Herbert H., Mar-  
thasville  
Schofield, Linn J., Warrens-  
burg  
Schudde, Otto N., Ferguson  
\*Schulte, Edward J., Girard,  
Kan.  
\*Scott, R. S., Jefferson City  
Seibel, Marshall G., St.  
Louis  
Settle, Emmett B., Rock Port  
Sewell, Walter S., Spring-  
field  
Shapiro, Lazare M., Kansas  
City  
Sharp, William L., St. Louis  
Shaw, William J., Fayette  
Shelton, Edward C., Eldon  
Shelton, Prior, Kansas City  
Siceluff, Joseph G., Spring-  
field  
\*Siever, Charles M., Picher,  
Okla.  
Silbsy, Don James, Mt. Ver-  
non  
Simmons, Leroy, Sarcoxie  
Simon, Jerome I., St. Louis  
Simpson, Emerson L.,  
Springfield  
Simpson, Morris B., Kansas  
City  
Sims, John L., Joplin  
Skinner, Edward H., Kansas  
City  
Skooog, Andrew L., Kansas  
City  
\*Smart, Lovisa, Webb City  
Smith, Arthur B., Kansas  
City  
\*Smith, Chester H., Pittsburg,  
Kan.  
Smith, Clinton K., Kansas  
City  
Smith, C. Souter, Spring-  
field  
Smith, James E., Rolla  
\*Smith, Ned R., Tulsa, Okla.  
Smith, Rollin H., Rich Hill  
Smith, Wallis, Springfield  
Smith, W. Russell, Carthage  
Snider, Samuel H., Kansas  
City  
Spalding, Wilber B., Platts-  
burg  
\*Spearing, Joseph W., Colum-  
bus, Kan.  
Spence, Elbert L., Kennett  
\*Squire, Edwin O., Coffey-  
ville, Kan.  
Stacy, Winton T., St. Joseph  
\*Steiner, Howard A., Toledo,  
Ohio  
\*Stevenson, Onnie E., Par-  
sons, Kan.  
Stewart, William J., Colum-  
bia  
Stockwell, A. Lloyd, Kansas  
City  
Stone, Murray C., Spring-  
field  
Stormont, Riley M., Webb  
City  
Stowers, James E., Kansas  
City  
Stratton, Charles D., Roth-  
ville  
Stricker, Emil A., St. James  
\*Striegel, V. W., Kansas City  
Strobach, Rolla L., Carthage  
\*Stucker, P. L., Bloomfield,  
N. J.  
\*Sturgis, Cyrus C., Ann Ar-  
bor, Mich.  
Sullivan, William J., Kirks-  
ville  
Summers, Jacob H., Lebanon  
Summers, Joseph S., Jeffer-  
son City  
\*Sutherland, J. R., Kansas City  
Talbot, Charles A., Waynes-  
ville  
Tarson, Solomon S., Kansas  
City  
\*Teubel, Edward C., Kansas  
City  
Thiele, George H., Kansas  
City  
Thompson, Ralph L., St.  
Louis  
\*Thompson, Wirt, Philadel-  
phia, Pa.  
Thornburgh, Albert H., West  
Plains  
Tilley, Robert B., Plato  
Titterington, Paul F., St.  
Louis  
Triplett, Jacob S., Harrison-  
ville  
Trowbridge, Barnard C.,  
Kansas City  
Van Ravenswaay, A. C. H.,  
Boonville  
\*Veazey, A. W., St. Louis  
Vinyard, Robert, Springfield  
Vitale, Nicholas S., St. Louis  
\*VonTrebra, Ernestine L.,  
Chetopa, Kan.  
\*VonTrebra, Robert L., Che-  
topa, Kan.  
Waddle, Theodore L., Dexter  
Waihoja, William J., Leba-  
non  
\*Walker, Charles F., Grove,  
Okla.  
Walker, George W., Cape  
Girardeau  
Walker, Grant D., Eldon  
Walker, Paul W., Joplin  
Walter, Archie L., Sedalia  
Walthall, Damon O., Kansas  
City  
Walton, Franklin E., St.  
Louis  
Waraich, G. S., Nevada  
Warmack, Ralph E., South  
West City  
Washburn, J. Loren, Ver-  
sailles  
Waters, E. B., Kirkwood  
Webster, Roger W., Carthage  
Welker, J. E., Kansas City  
Wensley, John E., Harrison-  
ville  
Werner, Charles H., St. Jo-  
seph  
West, William M., Monett  
Weyerich, Leon F., Cameron  
White, Charles H., Kansas  
City  
White, R. Ned, Springfield  
Wilbur, Herbert L., Joplin  
Wilcox, Claude V., St. Louis  
\*Williams, Harold O., Cheney,  
Kan.  
Williams, J. W., Jr., Jeffer-  
son City  
\*Wills, Robert L., Neosho  
Wilson, Clifford C., Kansas  
City  
Wilson, Fernando I., Kansas  
City  
Wilson, Ralph R., Kansas  
City  
Withers, Orval R., Kansas  
City  
\*Wolf, S. J., St. Louis  
Wolfe, Sharkey, Kansas City  
Wood, George F., Fulton  
Wood, George H., Carthage  
Wood, V. Visscher, St. Louis  
Woolsey, Ross A., St. Louis  
Wortley, Cabray, St. Joseph  
\*Wyly, William J., Kansas  
City  
\*Wynne, Francis E., Baxter  
Springs, Kan.  
Yancey, Daniel L., Spring-  
field  
Yeargain, John P., Irondele  
Young, H. McClure, Colum-  
bia  
Zimmermann, C. A. W., Cape  
Girardeau

Total 519

The effectiveness of various methods of remembering numbers is not universal but varies among individuals, according to *Hygeia, The Health Magazine*. For the person having greater visual acuity or a photostatic type of imagery, the printed series will be most easily retained.

## FIRST COUNCILOR DISTRICT

A. S. BRISTOW, PRINCETON, COUNCILOR

Nodaway-Atchison-Gentry-Worth Counties  
Medical Society

The Nodaway-Atchison-Gentry-Worth Counties Medical society met in the Linville Hotel, Maryville, May 6, for a dinner meeting. Dr. Clifton M. Waugh, Tarkio, president, presided.

Members present were Drs. Charles T. Bell, J. A. Bloomer, Carlos E. Cossins, Loren E. Egley, W. Raymond Jackson, R. C. Person and William M. Wallis, Jr., Maryville; Charles W. Kirk, Hopkins; Eugene Crowson, Pickering; Samuel E. Simpson, Stanberry; Henry R. Bauman, Fairfax; F. H. Rose, Albany; C. E. Benham, Charles H. Flynn and Clifton M. Waugh, Tarkio; Charles D. Humbert, Barnard; Benjamin F. Byland, Burlington Junction; C. R. Settle and Emmett B. Settle, Rock Port, and Joseph C. Manning, Skidmore. Guests present were Drs. M. G. Berry, Peter T. Bohan and Sam Lamborn, Kansas City; B. S. Barnes, Harold Bunch and W. H. Maloy, Shenandoah, Iowa, and Ed. Miller and Jesse Miller, Maryville, dentists.

It was voted that Drs. Emmett B. Settle, Charles T. Bell and Carlos E. Cossins, who have secured excellent programs, be retained for the remainder of the year as the program committee.

It was decided that the next regular meeting, scheduled for September 2, be postponed until October 7.

Dr. Emmett B. Settle announced that the program committee was contemplating an all day play-day to be held some time during the summer interim for all members of the profession who cared to attend at the Maryville Country Club. Arrangements were yet incomplete but the announcement elicited vigorous applause.

The Joplin Annual Session was discussed informally during the dinner and reports of the delegates were omitted.

Dr. Peter T. Bohan, Kansas City, discussed chronic infection in relation to systemic disease with special reference to arthritis, coronary sclerosis and hypertension. Dr. Bohan sketched the clinical picture of chronic bacterial endocarditis which, he postulated, lies back of all chronic arthritis, both hypertrophic and rheumatoid. His treatment is the removal of foci of infections plus symptomatic measures. His lecture was illustrated by lantern slides, moving pictures and presentation of a patient who had been cured of a severe generalized hypertrophic arthritis. Discussion followed.

CHARLES D. HUMBERT, M.D., Secretary.

## NINTH COUNCILOR DISTRICT

E. C. BOHRER, WEST PLAINS, COUNCILOR

## South Central Counties Medical Society

The South Central Counties Medical Society met at the Elliott Hotel, Mountain Grove, May 9, at 6:00 p. m. for a dinner meeting.

The medical care plan for Farm Security Administration families in the five county district was discussed in detail. The Society voted not to participate in the plan.

Dr. A. H. Thornburgh, West Plains, gave a report of the Annual Session at Joplin.

Application for membership was received from Dr. R. H. Ray, Willow Springs. By vote he was elected a member.

Members present were Drs. A. C. Ames, H. S. Frame and R. A. Ryan, Mountain Grove; J. R. Mott, Hartville; J. A. Fuson, Mansfield; Leslie Randall, Licking; L. M. Dillman and J. R. Womack, Houston; R. B. Tilley, Plato; R. H. Ray and C. F. Callihan, Willow Springs.

C. F. CALLIHAN, M.D., Secretary.

## TENTH COUNCILOR DISTRICT

E. J. NIENSTEDT, SIKESTON, COUNCILOR

## Cape Girardeau County Medical Society

The Cape Girardeau County Medical Society met at the Colonial Tavern, Cape Girardeau, June 7, at 8:30 p. m., with the president, Dr. C. T. Herbert, Cape Girardeau, presiding.

Members and guests present were Drs. G. A. Blaylock and J. J. Bredall, Perryville; W. L. Digges, New Madrid; A. C. Hamilton, Anna, Illinois; G. A. Sample, Chaffee; D. I. L. Seabaugh, Jackson; J. J. Drace, W. H. Wescoat, W. F. Oehler, G. W. Walker, Garland A. Reynolds, F. W. Hall, O. L. Seabaugh, P. B. Nussbaum, C. T. Herbert, D. H. Hope, D. B. Elrod, M. H. Shelby and C. A. W. Zimmermann, Cape Girardeau; Mr. Martin Nelson, Cape Girardeau, and Mr. F. W. Griffes, Memphis, Tennessee.

On approval of the board of censors, the application of Dr. Garland A. Reynolds, Cape Girardeau, by transfer from the St. Louis Medical Society, was voted upon and Dr. Reynolds made a member of the Society.

A letter from *Nation's Business* suggesting cooperation of members by presenting offered material before the people of the community, was referred to the committee on public relations for a report.

A film, "Experimental Work Done With Mare's Serum," was presented under the auspices of the Upjohn Company, Mr. Nelson and Mr. Griffes representing the company.

C. A. W. ZIMMERMANN, M.D., Secretary.

St. Francois-Iron-Madison-Washington-Reynolds  
County Medical Society

The St. Francois-Iron-Madison-Washington-Reynolds County Medical Society met May 31 at 7:30 p. m. at the St. Francois County Courthouse, Farmington.

Dr. Julius Jensen, St. Louis, presented a discussion on "Cardiology." His talk particularly dealt with the treatment of acute congestive failure. A long and interesting discussion followed.

Dr. W. H. Barron, Fredericktown, vice president, called the meeting to order and gave an account of the Joplin Annual Session. He particularly recommended that each member of the Society contact his Congressman to be sure that he was favorable to the advancement of medicine. He stated that the question of the medical care under the Farm Security Administration had been referred back from the State Association to each individual society and that in Madison County it was not being accepted.

Members present were Drs. C. H. Appleberry and Paul L. Jones, Flat River; Reuben Appleberry, F. R. Crouch, G. Tivis Graves, N. W. Hawkins, Emmett F. Hoctor, Ralph Kuhlman, James R. Mulkey and C. L. Watkins, Farmington; M. B. Barber, H. W. Barron, E. M. Bryan, Harold Frieheit and Shelby C. Slaughter, Fredericktown; Frank W. Gale, Bismarck; R. E. Harland, Ironton; Marvin Haw, Jr., H. M. Roebber, David E. Smith and Van W. Taylor, Bonne Terre; Joseph L. Thurman, Potosi; Arnold Traubitz, Leadwood; John P. Yeargain, Ironton.

G. TIVIS GRAVES, M.D., Secretary.

## BOOK REVIEWS

DIAGNOSIS AND TREATMENT OF DISEASES OF THE HAIR. By Lee McCarthy, M.D., Member of the American Dermatological Society, etc. With 291 illustrations including seven in color. St. Louis: The C. V. Mosby Company. 1940. Price \$9.50.

This is an extended and thorough treatise on a subject which badly needs such treatment. It is written by one



who is a student of Sabouraud and who is a recognized authority on histopathology. McCarthy opens, "It is surprising the lack of interest shown by physicians in general when consulted about disturbances in hair growth, whether they be true diseases of the scalp or only temporary loss of hair due to variations in the normal physiology . . ."

Anatomy, physiology and hygiene of the hair, disturbances in pigmentation, atrophies, hypertrophies, inflammatory diseases of the hair follicles, other diseases of the scalp which influence the hair, relation of the endocrine glands and benign and malignant growths that may occur on the scalp are the chapter headings.

After a perusal of the volume, the typography, illustrations and bookmaking, which are creditable to any publisher, the reviewer judges that the factual matter at the disposal of an authority on hair simply does not weigh much. The section on tinea is the best. The section of fifty-eight pages and twenty-five illustrations devoted to alopecia areata is phenomenal. Authoritative scholarship is immersed there, but in the reviewer's opinion there is not that much to write about the topic. Hypotheses of etiology of alopecia areata are given in the order of the author's preference: trophoneurotic, indirect action through disturbed endocrine function, dystrophic theory and parasitic theory. The words sound like science but one cannot make much out of them. This is no fault of McCarthy's. It is merely the current state of affairs, which can be summed in two words: cause unknown.

Recognizing this as the best book on hair, the reviewer is disconsolate and is apologetic for feeling disappointed. The author's industry must be praised but his thesis is factual only when obvious, for alopecia due to scarring disease of the scalp is unexceptionable yet trivial; and as for alopecia prematura, "No satisfactory explanation has ever been advanced why one person develops seborrhea and a resulting alopecia after he has had a pityriasis capitis and a pityriasis steatoides, while another individual keeps his pityriasis capitis his entire life without being subject to the production of seborrhea and alopecia. A still greater mystery is the fact that a certain number of men have seborrhea all their lives and yet never develop alopecia even in old age."

What little is known about diseases of the hair can be gleaned from the book.

R. L. S., Jr.

**AN INTRODUCTION TO MEDICAL MYCOLOGY.** By George M. Lewis and Mary E. Hopper of the Skin and Cancer Unit, New York Post-Graduate Medical School and Hospital, Columbia University. 307 pages and 71 full pages of composite illustrations. Chicago: The Year Book Publishers, Inc. 1939. Price \$5.50.

This book fills an actual need. It wastes not a word, instructs both the tyro and the specialist, and describes, illustrates and outlines treatment for a terra relatively incognito to the medical public, the fungous infections. It is a practical book for it clarifies the botanical features of the pathogens in direct relationship with the diseases they produce. Any intelligent and industrious medical person could with its help identify causative organisms and treat successfully (as successfully as anyone can) mycotic diseases which are comprised mainly of the dermatomycoses.

The authors write, "It is apparent that considerable confusion exists regarding fungous diseases. There is a widespread belief that the subject is hopelessly difficult. This is largely due to the faults of the available literature, with its involved nomenclature, emphasis on obscure problems and hairsplitting and tedious discussions on the classification of pathogenic fungi. At present, a dissertation on this purely botanic topic in the field of medical mycology would be not only uninteresting but unimportant." The reviewer agrees.

Excellent in every aspect are the divisions of the first part of the book with chapters on structure and physiology of fungi, methods of diagnosis of fungous disease, immunologic and allergic aspects of fungous infection and descriptions of the superficial mycoses. Occupational disease, commonly related to fungous infection, receives due attention.

The second part of the book, concerned with laboratory methods, is equally excellent. There are discussed direct examination of materials, distinctions from artefacts, cultural identifications, animal inoculations, characteristics of pathogenic fungi and characteristics of contaminants. Bibliographies are given.

Clarity, practicality, simplicity and pertinence are the keynotes of this small yet notably complete work. These are equally the personal features of the authors whose medical industry and laboratory experience, well known to the reviewer, combine to give unimpeachable authority to their writings.

The illustrations are clear and useful. No space is wasted in their compact arrangement. They help toward the consolidation of medical ground work, in which the authors have pioneered, toward the recognition of specific dermatoses produced by specific fungous pathogens. Dermatomycosis has been a scrap-heap. Until recently a practitioner has felt proud of himself when he knew a dermatosis was fungous rather than bacterial or chemical in origin. The time will come when fungous diseases will be recognized and named etiologically as tuberculous and syphilitic diseases are now recognized; and this book does some of the spadework in a most satisfying manner.

No laboratory, hospital library or medical practitioner who meets fungous infection in any of its manifold forms will regret the purchase of this book.

R. L. S., Jr.

**PRECLINICAL MEDICINE.** Preclinical States and Prevention of Disease. By Malford W. Thewlis, M.D., Attending Specialist, General Medicine, United States Public Health Hospitals, New York City, etc. A William Wood Book. Baltimore: The Williams & Wilkins Company. 1939. Price \$3.00.

Thewlis pleads for greater effort to recognize disease before it has advanced to the clinical state. Through a regular inventory he believes that illness may be minimized if not prevented entirely. He urges reduction of excessive fat through scientific dietary prescriptions, the eradication of focal infection and the control of disordered cholesterol metabolism. While the end that the author has in mind is a desirable one it is questionable whether it is realizable in the present state of knowledge.

B. Y. G.

**ENDOCRINE GYNECOLOGY.** By E. C. Hamblen, B.S., M.D., F.A.C.S., Associate Professor of Obstetrics and Gynecology, Duke University School of Medicine; Gynecologist in Charge of the Endocrine Division and Sex-Endocrine Clinic, Duke University Hospital, Durham, North Carolina. Foreword by J. B. Collip, M.D., Springfield, Illinois. Baltimore, Maryland: Charles C. Thomas. 1939. Price \$5.50.

As stated in the foreword this book has been prepared not for the specialist but for the general practitioner, and the author has tried impartially to interpret to the clinician the results of the extensive laboratory investigations of recent years on problems of sex physiology.

All phases are discussed and various points of view are presented. Sections on theoretical and experimental work on normal growth, development, adolescence, maturity, menstrual and gestational cycles and menopause are detailed and explicit. The attendant signs and symp-

toms are carefully described. Lucid descriptions of pathological sex endocrine syndromes are given and all worthwhile diagnostic procedures are outlined. After a discussion of the theories of endocrine therapy specific recommendations are made. The treatment recommended is generally safe, sane and rational. The author shows proper restraint and proper enthusiasm and undoubtedly has had tremendous experience. Each chapter is followed by a list of references. This bibliography is excellent and includes only the best texts and treatises. The illustrations and diagrams seem rather inadequate.

On the whole, this is a good book and the author has done a commendable piece of work on a difficult subject. The reviewer recommends this book without reservations.

L. C.

#### LANE MEDICAL LECTURES: VIRUSES AND VIRUS DISEASES.

By Thomas M. Rivers, M.D., Sc.D., Director, Hospital of the Rockefeller Institute for Medical Research, New York City. Illustrated. Stanford University, California: Stanford University Press. 1939. Price \$2.50.

The Lane Medical Lectures, of which this volume is a part, were established in 1896 by Dr. Levi Cooper Lane of San Francisco, founder of Cooper Medical College, now the School of Medicine of the Leland Stanford Junior University. A fund is maintained by the university for securing lecturers at intervals of two years. The first series of lectures was given in 1896 and with the present series includes twenty-seven. Various phases of medicine and scientific research have been presented in these series.

The present volume deals with certain general aspects of virus diseases and the agents inducing them. The first lecture discusses lymphocytic choriomeningitis and is followed by lectures on characteristic pathological pictures induced by viruses; consideration of serological and immunological phenomena associated with virus diseases; nature of the responsible agents including bacteriophage, certain plant viruses and the elementary bodies found in some of the virus diseases of animals, and a final chapter on prevention and treatment of virus diseases. In addition to the data on what is known of viruses, comprehensive material is given on some of the problems under investigation in this field.

**TREATMENT IN GENERAL MEDICINE.** Edited by Hobart A. Reimann, M.D., Magee Professor of Practice of Medicine and Clinical Medicine, Jefferson Medical College, Philadelphia. In three volumes and Desk Index. Illustrated. Philadelphia: F. A. Davis Company, 1939. Price \$30.00.

This is in reality a text by thirty-four outstanding authorities in various fields of general medicine including many of the best known names in modern medicine. Realizing that in the last twenty years the advances in medicine have been such that it is practically impossible for one man to deal adequately with the entire field of medical treatment, Reimann developed his text by inviting a number of distinguished specialists to contribute their knowledge on the various phases of the treatment of individual diseases.

Throughout the three volumes special attention is given to the newer methods of approach to disease, particularly in regard to etiology, symptomatology and diagnosis, as a basis for intelligent treatment. While diagnostic tests are stressed, the patient's personality and reaction to disease are not omitted and psychotherapy is recognized as an intimate part of treatment. Physical therapy, heliotherapy and mechanotherapy are discussed, not as specific treatments but as relief of

symptoms and assistance in rehabilitation. Minor surgery receives some attention as well as gynecologic and obstetric treatment and conditions associated with old age. The author states that the increase in the proportion of the senescent population makes consideration of geriatrics logical. A careful study was made of the relative frequency of various conditions and diseases dealt with in general practice and tables present this data.

The volumes emphasize standardized and controlled treatment and the remedies concerned are those available through the United States Pharmacopeia, the National Formulary and New and Nonofficial Remedies. A foreword by Dr. Morris Fishbein stresses the need for correct knowledge of drugs and pharmaceutical products and encourages the use of legitimate sources for information on such products.

Infectious conditions, parasitic diseases, the heart, the blood vessels, the gastrointestinal tract and the genitourinary tract are taken up in order. Technical therapeutic procedures, irradiation and various forms of physical and occupational therapy and spas are discussed. The discussions on prophylaxis are excellent.

A bibliography offers the reader ready reference for further study on any phase. The book is presented in a clear, direct style which adds to its value to the busy practitioner.

F. K.

**DIRECTORY OF MEDICAL SPECIALISTS.** Certified by American Boards. Paul Titus, Directing Editor; J. Stewart Rodman, Associate Editor. 1573 Pages. Morningside Heights, New York City: Columbia University Press. 1939. Price \$5.00.

This, the only official directory of its kind, lists approximately 14,400 Diplomates certified by the twelve special American Boards and one of the two affiliate boards.

A separate section is devoted to each American Board with both a geographic and a biographic listing of its Diplomates. In addition, there is a complete alphabetic list of all the 14,400 Diplomates. In this list there are addresses and indications of specialty certification, while in the geographic sections complete biographic information is given. The organization and examination requirements of each of the American Boards are explained in full.

These features make the directory unique and invaluable to specialists and general practitioners, hospitals, social agencies, libraries, medical societies, business organizations. It will help hospital officials pass on the ability of candidates for staff positions. It will provide medical society officers with authoritative lists. Family physicians can form an accurate judgment of the qualifications and ability of specialists in any branch of medicine for the benefit of patients. In short, it has so many practical uses that it is certain to be an indispensable reference tool for thousands of individuals and organizations.

**PNEUMOCONIOSIS (SILICOSIS) The Story of Dusty Lungs.** A Preliminary Report. By Lewis Gregory Cole, M.D., Director of Silicotic Research, John B. Pierce Foundation, New York City, and William Gregory Cole, M.D., New York City. New York: John B. Pierce Foundation. 1940.

This little volume prepared by one of the country's foremost roentgenologists is unique in its method of approach to the study of the silicosis problem and arrives at some rather startling conclusions. It is simply written and easily understandable. Its methods are unique and original and its conclusions logical. Its introduction of the photometer in the study of roentgen ray plates of silicosis is new. Altogether, it offers a very valuable addition to our rapidly developing knowledge of silicosis.

S. H. S.



# THE JOURNAL

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### ACUTE SUPPURATIVE PLEURISY

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MADISON, WIS.

When the cases of empyema which had been admitted to the Wisconsin General Hospital over a period of seven years were reviewed and it was found that more than 40 per cent of these cases were in the chronic stage of disease and doomed to invalidism without further surgical treatment, it was decided that further discussion of empyema would not be superfluous. An overwhelming majority of these patients had not received proper treatment during the acute stage of their disease. This was due to several factors, anatomic, physiologic and pathologic, which were not understood sufficiently to allow the proper application of fundamentals. There is little excuse for such glaring errors since more than twenty years ago Graham, in his elaborate investigations, proved without doubt that empyema could be treated successfully with an accompanying low mortality provided there was a thorough understanding of the pathologic physiology. During the last fourteen years I have used and applied successfully the axioms laid down by Graham; and throughout this discussion I shall make many statements, the authority for which originated with Dr. Graham.

Empyema may occur from a variety of causes which include penetrating or crushing wounds of the chest, pericarditis, mediastinitis, lung abscess, bronchiectasis, carcinoma of the lung and subdiaphragmatic abscess.

It most commonly occurs as a complication of bronchopneumonia or lobular pneumonia due to the hemolytic streptococcus or as a sequel to lobar pneumonia due to the pneumococcus. Other microorganisms such as the staphylococcus, Friedländer bacillus, colon bacillus and the gonococcus are responsible in a smaller group of cases.

The portal of entry in the more common cases associated with pneumonia is generally conceded to

occur as a result of a spread from a subpleural pneumonitis by way of the lymph stream, direct continuity, rupture of an abscess and possibly by way of the blood stream.

From the time the newborn infant takes his first breath, respiration becomes one of the vital functions. Once inflated, the lungs continue to remain in a degree of partial inflation, even after maximum voluntary expiration. The visceral pleura covering the lungs lies in close contact with the parietal pleura lining the thoracic cage. At the time of birth the lungs and thoracic cage are approximately the same size, but during the first few months of life the thorax grows more rapidly than the lungs. This discrepancy in size combined with the pull of the elastic fibers within the lung tends to pull the latter away from the chest wall which results in an increase in the surface tension between the two layers of pleura and the production of a negative or sub-atmospheric pressure. The negative pressure increases throughout the inspiratory phase of respiration and returns to its original level at the end of expiration. The amount of air which partially is sucked into the lungs and forced out during a respiratory phase is spoken of as the tidal air, the volume being roughly 500 cubic centimeters when the individual is at rest. This small quantity of air is not sufficient to permit violent physical activity. Nature, however, has provided a reserve in a healthy individual which can be drawn upon as needed. This amounts to about eight or ten times the basal tidal air requirement. It is therefore possible to inspire and expire much larger quantities of air on maximum effort. These two values are spoken of respectively as the complemental and supplemental air. The volume of each is about 1,800 cubic centimeters. These, plus the tidal air, represent the vital capacity which may be defined as the maximum amount of air which can be expired after a maximum inspiration. It was stated previously that the lungs could not be deflated entirely by voluntary effort. The air that still remains in the lungs after a maximum expiration is known as the residual air (1,500 cubic centimeters). This is most fortunate since the volume of tidal air is not sufficient to inflate fully a totally collapsed lung.

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Presented at the 83rd Annual Session of the Missouri State Medical Association, Joplin, April 29, 30, May 1, 1940.

During respiration the tidal air dilutes the residual air and at the same time permits longer contact between the inspired air and the capillaries of the alveoli, which insures a more adequate gaseous exchange.

The mediastinum and its contents form a partition between the two pleural cavities. It is a flexible structure and readily changes its position when alterations in pleural pressures occur.

The alteration in intrapleural pressures in a normal chest present an interesting problem. Due to the reserve in the form of complemental and supplemental air the lungs are capable of meeting the increased demands which may be thrown upon them. It is because of this reserve that it is possible to create an open pneumothorax in both pleural cavities and still maintain life so long as the openings are not too large. In the presence of bilateral pneumothorax the lungs fall from the chest wall to a partially collapsed position. Air rushes into the pleural spaces with each inspiration and the difficulty of obtaining a proper air exchange is increased. As long as the openings are of such size that a partial negative pressure can be created in the pleural space through the rapid enlargement of the thoracic cage during inspiration, the underlying lungs will inflate to a certain degree. Theoretically as long as the tidal air requirement is satisfied, asphyxia should not occur. However, this is not absolutely true because more work is demanded of the respiratory muscles to compensate for the crippled respiratory mechanism, thus occasioning an increase in depth and rate. Gradually fatigue and ultimate exhaustion occur. Healthy persons with a well developed musculature and a high vital capacity can endure larger openings over a longer period of time than weaker ones with a low vital capacity and less endurance.

If an open pneumothorax is established in the left pleural cavity, the underlying lung falls away from the chest wall and the mediastinum shifts to the right causing an almost equal amount of collapse of the opposite lung, the slight discrepancy being due to resistance of the mediastinum. The larger the opening in the thorax, the greater the degree of collapse of both lungs. Asphyxia will result when the size of the opening is increased to a point at which with maximum effort a negative pressure cannot be created to allow sufficient inflation of the lungs to satisfy the tidal air requirement. The same applies to a bilateral open pneumothorax. The introduction of air or fluid into the pleural cavity also will produce the same effect on the mediastinum and lungs. In the normal individual, for practical purposes, one must assume that the thorax functions as one unit and that the mediastinum which separates the pleural cavities offers little resistance to pressure changes.

The questions now arising concern the effect of the pathologic state on the respiratory mechanism and the proper application of the known physiologic principles in the treatment of empyema.

Empyema caused by the streptococcus hemolyticus usually occurs as a complication of bronchopneumonia or lobular pneumonia and the onset is abrupt. The individual develops an acute upper respiratory infection which within a few hours spreads rapidly to the trachea and smaller bronchi. This is accompanied by a profound toxemia. A massive pleural effusion may occur simultaneously on the same side. This sudden and overwhelming involvement of the pleura produces a massive or non-adherent type of infection. Early in the disease the underlying lung is collapsed and splinted in that position by the effusion. Dyspnea and cyanosis appear early and are accompanied by restlessness, high fever and increasing toxemia leading to delirium. At this stage we are dealing with a patient whose vital capacity has been reduced to a point little more than his tidal air requirement. This circumstance exists primarily because of the marked reduction of the functioning lung through disease (pneumonia and toxemia) and, to a lesser degree, the accompanying pleural effusion which not only collapses the diseased lung but pushes the mediastinum to the opposite side and interferes with the function of the normal lung.

It is at this stage of the disease that the first mistake usually is made. The primary cause of this precarious state, that is, the pneumonitis, is overlooked and attention erroneously focused on the pleural effusion. The first therapeutic procedure is directed at removal of the fluid either by thoracentesis or thoracotomy. The immediate result is often unsatisfactory or fatal. It is my opinion that the thoughtless removal of a large pleural exudate at this stage is to be heartily condemned. It creates a high negative pressure within the pleural space and not only mobilizes but, by forcing expansion of a friable, infected and inflamed lung with resultant tearing, opens new avenues for the spread of infection. On many occasions within one hour after a thoracentesis with the removal of only 30 cubic centimeters of fluid there occurs a sharp rise in temperature and an increase in toxemia. The same result is noted if at this time fractional decompression is used by closed catheter drainage. Any such procedure may in the seriously ill patient throw the balance in favor of the disease. As long as the acute infection (pneumonitis) persists, only small diagnostic aspirations should be made (Fig. 1). The primary problem is the treatment of the pneumonia and all attention should be directed toward that end. If the patient successfully withstands the pneumonia, the effusion can be handled quite satisfactorily at a later date. At the time of the first aspiration the thin fluid should be removed in a sufficient quantity to permit bacteriological studies and to fill a properly labeled test tube for future study. This fluid after standing for a few hours will separate into two layers. At the height of the pneumonia there will be little sediment at the bottom of the tube and a deep layer of thin clear greenish fluid above. On subsequent aspirations at intervals of



two to three days the fluid will thicken and on settling will show an increasing amount of sediment. About the twelfth to fourteenth day the fluid no longer settles out but is a frank pus. During this period the pneumonic process has been subsiding as noted by lysis of the fever and decreased toxemia. By this time the patient's vital capacity has increased and the air hunger disappeared but he is still weak. Again, it is thought the necessity of evacuation of the pus is paramount. This is not true. There is no emergency. The drainage should be carried out at the optimum time which does not occur until the patient has regained sufficient strength to withstand the procedure.

During the acute stage of the pneumonic process one is not dealing with an empyema but with a pleural effusion. The creation of an open pneumothorax for drainage would, just as in the normal chest, cause an added collapse of both lungs and the added insult to the already badly crippled respiratory exchange would result in asphyxia. If the pneumonia is allowed to subside, drainage can be instituted safely. The thin fluid thickens as localization takes place and the pleural layers and the mediastinum become thickened, edematous and covered with a fibrinous exudate. They then become rigid pyogenic walls surrounding a localized collection of pus. Open drainage at this stage does not permit a mediastinal shift because the inflammatory process has thickened the walls of the cavity sufficiently to withstand atmospheric pressure without change in position.

The failure to observe the following facts, namely, the importance of the pneumonia, the necessity for localization of the pleural infection and the effect of changes in intrapleural pressures in the thorax, will lead to an inexcusably high mortality.

In empyema associated with pneumococcus pneu-

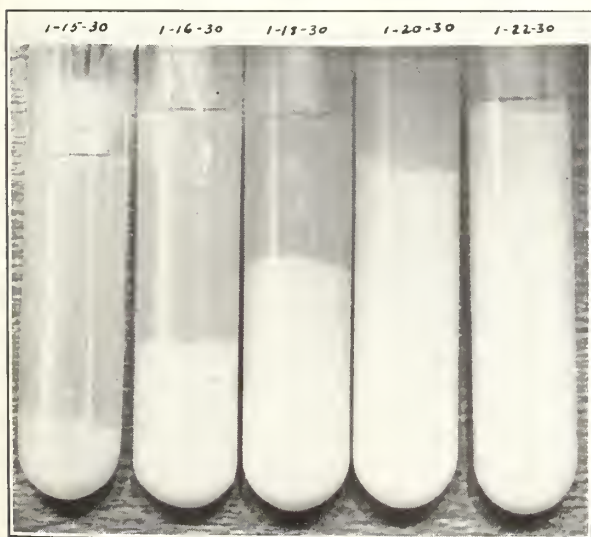


Fig. 1. Tubes of fluid obtained through repeated thoracentesis from a patient suffering from a bronchopneumonia complicated by a pleural effusion. The increase in the amount of pus is shown clearly after the tubes were allowed to stand for twenty-four hours.

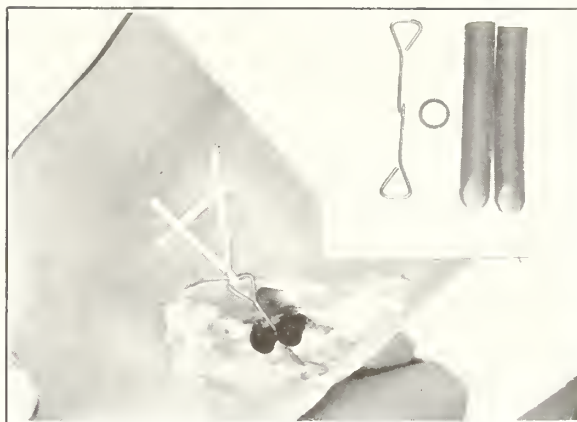


Fig. 2. The rubber drainage tubes in place held firmly by adhesive strips. Insert shows the component parts. The tubes regularly employed are  $\frac{3}{4}$  inch in diameter.

monia the mortality always has been lower. This can be explained readily. In this type of empyema the effusion seldom is recognized at its inception due to the difficulty of physical examination of an involved consolidated lobe. The collection of fluid is more apt to be localized or encysted and by the time the fluid is recognized the pneumonia has subsided and the empyema cavity is thoroughly walled off as a localized abscess. It is because of these existing conditions that one usually speaks of this type of empyema as a sequel to the pneumonia. Here again as in the streptococcus type, drainage should not be hurried. A few days should elapse to allow further convalescence from the effects of the primary disease.

The first object in the treatment of empyema is, of course, to save the patient's life. This is best accomplished by treating the pneumonia. If successful, attention then is directed to the drainage of the pleural exudate. This can be done in a variety of ways, but this discussion will be limited to that of open drainage accomplished by the resection of a segment of rib. By careful physical examination and by roentgen ray films taken from different angles the size of the cavity can be determined. Local or gas anesthesia may be employed. A thoracentesis is performed to confirm the proper position for the incision and the underlying rib is exposed. A subperiosteal resection is performed, removing a section of the rib at the most dependent portion of the cavity. The cut ends of the rib are plugged with bone wax to prevent osteomyelitis. The inter-costal nerves of the resected rib and the one above and below are injected with 70 per cent alcohol to reduce postoperative pain. A small opening is made in the thickened parietal pleura which permits the slow entrance of air. A sudden entrance of a large quantity of air through a large incision might tear the localizing adhesions and allow further contamination of heretofore uninvolved pleura. The patient's condition is watched closely after the initial opening. If it is not tolerated well, a catheter is inserted and the patient returned to his room

with an air-tight drainage and the pus allowed to escape under water. After a few days the catheter is removed and the opening enlarged. Ordinarily, however, there is no difficulty and the pleura can be incised widely on the operating table. A piece of pleura is removed for microscopic examination to elicit the possible presence of an overlooked tuberculous involvement. The pus and loose fibrin are carefully aspirated and the walls of the cavity inspected. The walls are usually gray in color and covered with a shaggy fibrinous exudate. The movement of the underlying lung is noted since it gives same criterion to the rapidity with which it can be expected to expand. An estimate is made of the size of the cavity. At this time the forceful expansion of the lung under positive pressure by the anesthetist or permitting the patient to engage in violent respiratory movements are to be condemned because of the danger of tearing protective adhesions. Rubber tubes are inserted into the opening and a dry dressing applied (figs. 2 and 3). No stitches are used to close the wound. The patient is not disturbed during the next twenty-four hours except to change soiled dressings. The cavity is then irrigated with normal saline solution to determine its size and the presence of a bronchopleural fistula. The latter is recognized easily since as soon as the saline enters the fistula coughing will occur. In the presence of a fistula only saline irrigations should be used until it heals. Any antiseptic solution would result in too much irritation and might prove dangerous. If a fistula does not exist we use irrigations of .5 per cent sodium hypochlorite (Dakin's solution) q.i.d. The patient is turned on his good side with the thoracotomy wound at the highest point and the cavity filled. The solution is allowed to remain in the cavity for ten minutes, after which it is drained out. The skin

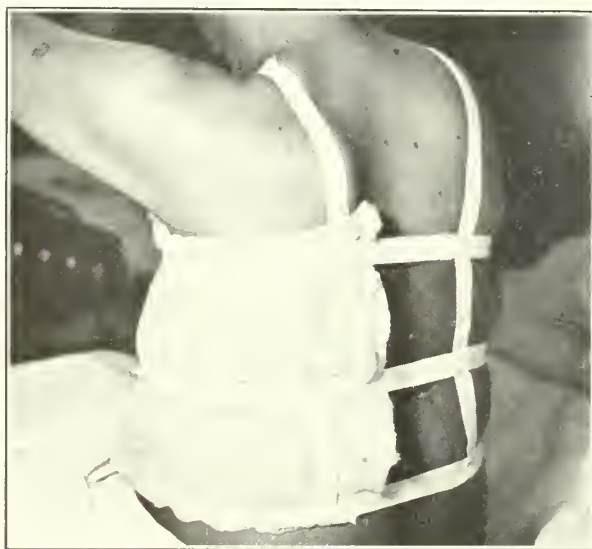


Fig. 3. The skeleton elastic jacket which is worn to hold dressings in place following operation. This eliminates the use of adhesive strips, permits free expansion of the thorax and is comfortable as well as efficient.

is dried carefully to prevent further irritation from the solution. Dakin's solution is left in the cavity for the short period of time because it loses its potency quickly and becomes inert. Through the use of this routine the patient enjoys a dry dressing at all times. Many solutions have been used for irrigations. I have continued the use of Dakin's solution because of its fibrinolytic and antiseptic qualities. Convalescence is shortened by the early removal of fibrin, a more rapid sterilization of the cavity and earlier expansion of the underlying lung. These cavities must heal through granulations at the periphery. Once dependent drainage is established it must be maintained through tubes until the lung has expanded and the cavity is obliterated to the point of the thoracotomy wound in the chest wall.

The nutrition of the patient must not be overlooked. The diet must be high in protein to maintain a positive nitrogen balance. It is not uncommon to see a patient gain five pounds per week for a period of eight weeks if supplied with a sufficient amount of the proper high caloric diet. He is allowed out of bed as soon as his temperature reaches normal which is usually within from seven to ten days after operation.

The length of convalescence varies depending upon the amount of lung destruction and the size of the cavity, the thickness of the fibrinous exudate on the pleura and the maintenance of adequate drainage. The average time required for convalescence in children is about six weeks and in adults about eight weeks.

Failure of the cavity to close occurred in more than 40 per cent of the patients admitted to our hospital. The most common cause was inadequate drainage. This occurred through too early removal of the tubes, failure to sterilize the cavity and to maintain dependent draining. Again, foreign body ranks high in the causes of failure. Through carelessness in fixing drainage tubes a tube may fall into the cavity and be unrecognized. Splinters of an unevenly divided rib may fall into the cavity, sequestrate and continue to harbor infection and cause irritation until removed.

An inexpandible lung may prevent closure in rare instances. This occurs in two ways. During the pneumonia the actual necrosis of the lung may be so great that with healing the lung may be reduced to an inexpandible fibrous mass and in certain cases in which the effusion was not recognized for weeks or months after the onset, the fibrinous exudate covering the pleural surfaces becomes organized into fibrous tissue, splinting an otherwise expandible lung in a collapsed position.

Bronchopleural fistula precludes the use of Dakin's solution irrigations but seldom persists long enough to prevent healing. It may prolong convalescence, however.

Tuberculosis superimposed should not come as a surprise if the section of pleura was examined at the time of operation. Mistaken diagnosis may result in failure of the cavity to close. In rare in-



stances large infected congenital cystic lung cavities have been drained as empyema cavities. The presence of a persistent bronchopleural fistula and failure to close should stimulate further study.

When expansion of the lung is slow as manifested by little change in the size of the cavity, blowing exercises frequently will assist reexpansion. These as usually carried out are of little or no value since an open pneumothorax exists. The exercises should be done once a day, but under supervision. The bandage should be removed and it is noted that air is sucked into the cavity on inspiration and forced out on expiration. To create the highest intrapulmonic pressure safely and efficiently the following procedure is used. The patient is asked to expel all the air possible from his lungs. Then, closing the thoracotomy wound tightly he is instructed to take the deepest possible breath. This permits the intake of a large amount of air and by creating a closed pneumothorax there is little to interfere with the efficient expansion of the underlying lung. This procedure is repeated four or five times over a period of five minutes. As healing progresses it is necessary to shorten the drainage tubes to prevent their contact with the visceral pleura. Once the cavity is obliterated to the site of the thoracotomy wound, and not until then, is it safe to remove the tubes after which the wound in the chest wall heals quickly and permanently.

#### SUMMARY

The treatment of empyema will continue to result in a high mortality and morbidity as long as the underlying physiology and pathologic physiology are not properly understood.

The important points to be considered in the treatment of empyema are:

1. Treat the primary disease (pneumonia) and save the patient's life.
2. Avoid drainage (open or closed) until the infection has localized (walled off) and the acute phase has subsided.
3. Open drainage must be adequate and dependent.
4. Rapid sterilization of the cavity hastens early obliteration and prevents chronicity.
5. Prevent a negative nitrogen balance by the use of a proper diet.
6. Remember that an acute empyema is not an emergency.

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#### BRITISH EMBASSY REGISTERING AMERICAN PHYSICIANS FOR SERVICE IN BRITAIN

"The British Embassy is registering the names of American physicians who volunteer for service in the United Kingdom in the treatment of war casualties so as to have available a list of men who may be called on if the need arises," *The Journal of the American Medical Association* for June 29 reports. "The statement is made that these men are required mainly for the treatment of civilian casualties and that there is no question of enrolling these men in the medical services of the war forces."

## PNEUMOPERITONEUM IN THE TREATMENT OF PULMONARY TUBERCULOSIS

A REPORT BASED ON THE STUDY OF FIFTY CASES

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Pneumoperitoneum is the technical term for the procedure of introducing air into the peritoneal cavity. It has been in use for diagnostic purposes since 1902 and as a therapeutic measure since 1917.

Numerous investigators during the last three decades have reported their experiences with this method of treatment in tuberculous enteritis and peritonitis with apparently satisfactory results. Among these may be mentioned McGlinn<sup>1</sup> of Philadelphia who in 1908 reported the successful treatment of tuberculous peritonitis by inflating the peritoneal cavity with oxygen. Meeker<sup>2</sup> in 1912 reported a similar result. Weil and Laileseur<sup>3</sup> in 1921 reported their experiences with air injections after the removal of the fluid in six cases of tuberculous peritonitis with ascites. Although only from one to five treatments were given they obtained 50 per cent cures. Then followed Fritz<sup>4</sup> in 1921, Stein<sup>5</sup> in 1922 and Mattick<sup>6</sup> in 1924 with similar results. They, however, used oxygen as the gas of choice.

In 1924 Gilbert<sup>7</sup> employed air with satisfactory results. It remained, however, for Banyai<sup>8</sup> to report the first observations on the effect of pneumoperitoneum upon pulmonary tuberculosis.

He states that the realization of the idea that artificial pneumoperitoneum is of value as a therapeutic agent in this disease was forced upon him by a technical error while administering artificial pneumothorax to one of his patients in 1931. The patient had a far advanced bilateral pulmonary tuberculosis. An exeresis of the left phrenic nerve caused an elevation of the left dome of the diaphragm of only one finger's breadth. Subsequent events proved that the nerve block was insufficient to check the progress of the disease. The patient had a massive hemorrhage. Artificial pneumothorax was started immediately in spite of such attempts ending in failure before the phrenic block because of extensive pleural adhesions. The patient was given eight inflations, the amounts of air varying from 100 to 800 cc. The final manometer readings were on the positive side four times. At the ninth attempt the initial manometer reading was -5 and the inflation was closed with a -1 reading after the injection of 1000 cc. of air. Roentgenograms showed that an artificial pneumoper-

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Read at the 82nd Annual Session of the Missouri State Medical Association, Excelsior Springs, April 10-12, 1939.

itoncum was established instead of the intended artificial pneumothorax. The benefits of the pneumoperitoneum were noticed by the patient as well as by the attending staff. The recurring hemorrhages were stopped and the appetite and general condition improved under the effect of continued pneumoperitoneum treatment.

Reviewing a rather large group of patients in whom he used pneumoperitoneum for intestinal tuberculosis since 1929, some of the unexplainable observations became self evident. At that time he was using oxygen for the injections and thought that the immediate euphoria and the disappearance of toxic symptoms, often seen in patients in a few days or weeks after the beginning of the treatment, were attributable to the absorption of oxygen that supposedly relieved anoxemia and acted as a mild cardiac and respiratory stimulant. The use of air instead of oxygen during the last few years convinced him that the cause of the benefits of pneumoperitoneum must be sought in the mechanical effect of the injected gas rather than in its chemical action.

The two most important immediate effects of the procedure are: first, the drainage of inflammatory products from cavities and from the bronchial tract; second, a relatively functional rest of the diseased lungs.

Experience at Mt. St. Rose Sanatorium during the last eighteen months has shown definitely that the introduction of air into the peritoneal cavity at weekly intervals causes a definite sustained elevation of the diaphragm. This elevation is similar to that following a phrenic operation but has the advantage that it applies to both leaves of the diaphragm at the same time. The resulting therapeutic effect is identical with the effects of a phrenic operation, and in many instances far more satisfactory. There is no permanent injury to the diaphragm and if the method proves unsatisfactory therapeutically in a given case it can be discontinued immediately and the previous anatomical relationship be restored to normal. The direct beneficial effects are somewhat similar to those of a pneumothorax. At first an immediate relaxation of the diaphragm is brought about by its elevation and limitation of excursion during respiration. The apical-basal diameter is greatly decreased, thereby limiting the respiratory excursion. This results in an increased rest to the lungs followed by clearing up of the symptoms due to toxemia and in many instances closure of cavities.

The indications for artificial pneumoperitoneum in the treatment of pulmonary tuberculosis are as follow:

1. Severe pulmonary hemorrhage that cannot be controlled by other means such as pneumothorax, phrenic operation or bed rest or a combination of these methods.
2. If artificial pneumothorax is indicated but cannot be established because of adhesions.

3. After pneumothorax has been discontinued and the disease becomes reactivated and it is impossible to reestablish artificial pneumothorax.

4. As an adjunct to a phrenic nerve block when the procedure fails to bring about a sufficient elevation of the diaphragm or fails to produce a negative sputum.

5. If the disease is too extensive for a bilateral pneumothorax, particularly in people over 50 years of age.

6. Following delivery when a pneumothorax is not feasible or cannot be induced.

7. In cases of tuberculous enterocolitis or tuberculosis of the mesentery.

8. When it is desirable to collapse the basal portion of the pneumothorax lung but is impossible to do so by pneumothorax alone because of adhesions.

9. In cases of persistent vomiting or gastric upsets following a left phrenic operation.

And, finally, in any cases in which all other therapeutic measures have been tried and found to be unsuccessful, it should at least be given a trial.

The contraindications follow:

1. A generalized tuberculosis throughout the body.

2. Amyloidosis.

3. Obliterative peritonitis which causes difficulty in entering the abdominal cavity.

4. Any cardiac lesions.

Complications may be as follow:

1. A peritoneal effusion, large or small.

2. Formation of adhesions.

3. Mediastinal emphysema; the air gets into the mediastinum through the diaphragmatic attachments symptoms of which are retrosternal with pain, cough, expectoration and difficulty in swallowing, with pain in the larynx.

4. An incidental, accidental pneumothorax.

#### TECHNIC

The patient is placed in the recumbent position on his back. The sites of choice are a point just to the left of the rectus muscle and midway between the umbilicus and the lower costal border in the left upper quadrant of the abdomen, or a point two inches below and lateral to the umbilicus. The area is swabbed with tincture of iodine and alcohol and an infiltration of  $\frac{1}{2}$  per cent novocaine solution through the skin down to the peritoneum is made, using from 3 to 5 cc. of the local anesthetic. Then an 18 or 19 gauge pneumothorax needle is introduced through the anesthetized area into the peritoneal cavity and connected with the pneumothorax machine. The needle is introduced at a slight angle to avoid direct pressure on the viscera. The danger of perforating an intestine is practically nil as the omentum intervenes. Experiments on cadavers have shown that it is impossible to do so.

The amount of air usually administered at the first treatment is about 300 cc. Thereafter, at



weekly intervals, we usually give amounts varying from 500 to 1500 cc. depending upon the extent of the elevation of the diaphragm desired.

Occasionally after the initial treatment, there is slight discomfort resulting from the displacement of the abdominal viscera. The diaphragm tends to elevate itself immediately and the liver, spleen and stomach are pushed downward to a certain extent.

Usually pain in the shoulder region and sides of the chest is associated with this from phrenic and intercostal nerve irritation which disappears within twenty-four hours.

The mechanical effects of this procedure are: (1) bilateral elevation of the leaves of the diaphragm; (2) separation of the liver, spleen and stomach from the diaphragm; (3) diminution in the size of the thoracic cage, favoring a selective collapse of the diseased lung tissue, and (4) selective elevation of one of the leaves of the diaphragm, especially in a unilateral involvement or in cases in which the greatest amount of pathology is limited to one lung.

#### PHYSIOLOGICAL EFFECTS

Resulting from the mechanical effects, the following physiological changes naturally take place: (1) lymph stasis which favors fibrous tissue formation; (2) tissue anoxemia in which tubercle bacilli cannot grow; (3) pulmonary congestion which inhibits the growth of the tubercle bacillus, and (4) approximately 15 to 35 per cent reduction in the chest capacity as seen from the roentgenologic standpoint.

During the last eighteen months we have employed this method of treatment at Mt. St. Rose Sanatorium in fifty cases.

Table 1. Sex and Age Incidence

	Number	Per Cent
Male	15	30
Female	35	70
15-20 years	1	2
20-30 years	31	62
30-40 years	14	28
Over 40 years	4	8

An analysis of table 1 reveals the preponderance of females over males, viz., thirty-five or 70 per cent of the patients treated. The age incidence shows the greatest number in the 20 to 30 age period, thirty-one or 62 per cent.

Table 2. Type of Cases in Which Pneumoperitoneum Was Administered

	Number	Per Cent
Minimal	0	
Moderately advanced. A.	0	
Moderately advanced. B.	0	
Moderately advanced. C.	1	2
Far advanced. A.	0	
Far advanced. B.	6	12
Far advanced. C.	43	86

Tables 2, 3 and 4 indicate that forty-nine or 98 per cent were of the far advanced type C bilateral, and 18 per cent of this group were in the terminal stage with complications such as tuberculous laryn-



Fig. 1. Normal adult chest showing normal level of leaves of diaphragm between the tenth and eleventh ribs.

gitis, fifteen or 30 per cent, and tuberculous enterocolitis, nine or 18 per cent.

Table 3. Extent of Pathology Present

Unilateral	None
Bilateral	50 or 100 per cent

Table 4. Complications Present at Time of Onset of Treatment

	Number	Per Cent
Laryngitis	15	30
Enterocolitis	9	18
Syphilis	1	2
Massive hemorrhage	1	2
Terminating	9	18

Table 5 reveals the important fact that twenty-six or 52 per cent of all patients treated with pneumoperitoneum had already received the benefit of other available forms of mechanical therapeutics, together with bed rest over a long period of time, in some instances of two to three years duration

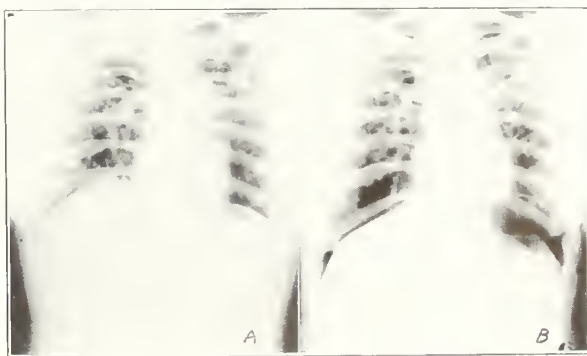


Fig. 2. (Case 1.) A. Roentgenogram before pneumoperitoneum, elevation of diaphragm at tenth rib. B. Roentgenogram after pneumoperitoneum, elevation of diaphragm at ninth rib.

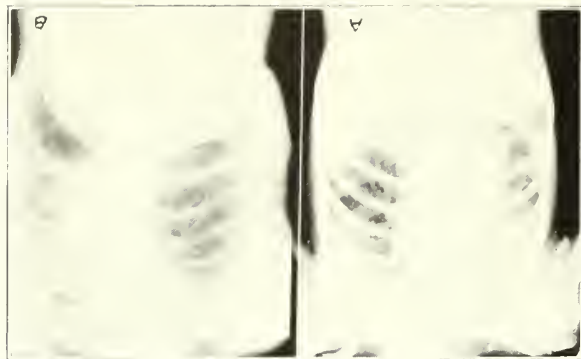


Fig. 3. (Case 2.) A. Elevation of diaphragm before pneumoperitoneum at the eleventh rib. B. After pneumoperitoneum elevation of diaphragm at the level of the ninth rib.

without bringing about an arrestment of the progress of the disease process or a negative sputum.

Table 5. *Types of Treatment Given Prior to Initiation of Pneumoperitoneum Without Satisfactory Results*

	Number	Per Cent
Phrenic nerve operation	11	22
Unilateral pneumothorax	8	16
Bilateral pneumothorax	3	6
Pneumothorax and phrenic operation	4	8
Total	26	52

Table 6 shows the duration of pneumoperitoneum treatment up to December 1, 1938. It is necessary to emphasize the fact that many of these patients were extremely far advanced and in the terminal stage when this treatment was instituted and, in many of these cases, the number of treatments ranged from only two to ten without any apparent benefit at time of death. Consequently, in the last six months, such type cases were not subjected to this form of treatment and will not be in the future as it is clearly evident from our experience that it is unfair to try a given treatment when chances for improvement or recovery are practically hopeless. Hence, we have only one patient who has received treatment over a period of twelve months because the majority of our mortalities occurred in the first few months of this form of treatment when we were taking virtually hopeless patients.

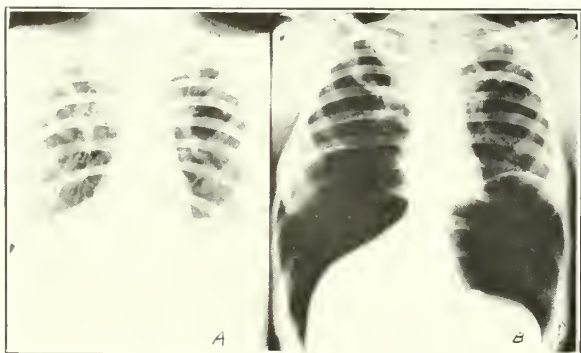


Fig. 4. (Case 3.) A. Before delivery and before pneumoperitoneum the diaphragm at the level of the tenth rib. B. Approximately nine months later diaphragm at the level of the eighth rib on the right side and at the ninth rib on the left side.

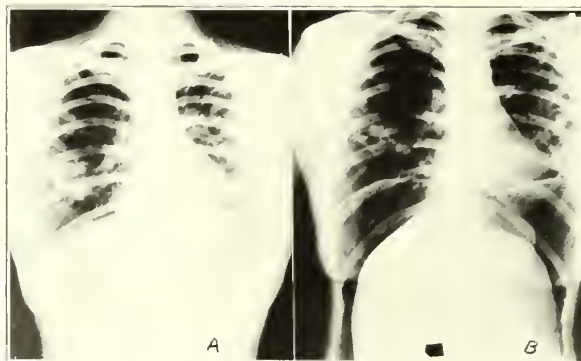


Fig. 5. (Case 4.) A. Diaphragm at the level of the tenth rib. B. About six months later the diaphragm at the level of the ninth rib.

Table 6. *Duration of Pneumoperitoneum Treatment to Dec. 1, 1938*

Months	Number	Per Cent
1-3	21	42
3-6	18	36
3-12	10	20
12-18	1	2

A study of table 7 reveals the character of end results up to December 1, 1938. It will be readily observed that six or 12 per cent became quiescent cases with negative sputums. These are still under observation and treatment and two of them have resumed their former occupation.

Table 7. *End Results Obtained to Dec. 1, 1938*

	Number	Per Cent
Quiescent (negative sputum)	6	12
Improved	24	48
Unimproved	2	4
Deaths	18	36

When one considers that twenty-six of the fifty patients were hopeless from any point of view after having received various other forms of treatment, and then showed a marked improvement following pneumoperitoneum, one must, therefore, concede that there is a distinct place in our armamentarium for this form of therapeusis.

#### REPORT OF CASES

Case 1. I. B., woman, aged 28, entered Mt. St. Rose on February 18, 1938, with a diagnosis of moderately advanced B, bilateral tuberculosis with extensive involvement of the upper half of both lungs. Pneumothorax and phrenic operation were contraindicated and on March 30, 1938, a pneumoperitoneum was established. Since that time the patient has shown an uninterrupted improvement and at time of discharge on September 11, the Schilling was normal and sputum negative. She was free of all symptoms and was discharged as a quiescent case. Figure 2a shows the elevation of diaphragm at the tenth rib before pneumoperitoneum; figure 2b shows the elevation at the ninth rib after pneumoperitoneum.

Case 2. B. W., woman, aged 25, entered Mt. St. Rose on July 3, 1937, with a diagnosis of far advanced B, bilateral tuberculosis, positive sputum, terminating type, complicated by tuberculous laryngitis. Artificial pneumothorax was unsuccessful. Pneumoperitoneum was initiated on August 12, 1937. The patient was under treatment for about four months.

During this period all clinical symptoms disappeared



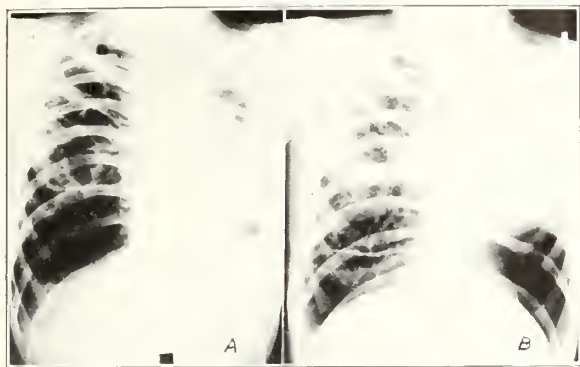


Fig. 6. (Case 5.) A. Diaphragm at the level of the eleventh rib on the right side and at the tenth rib on the left side. B. Four months later the diaphragm at the level of the eighth rib on the left side.

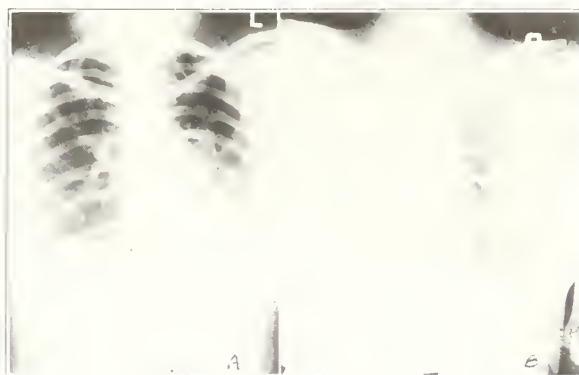


Fig. 7. (Case 6.) A. An obliterating pneumothorax. B. Roentgenogram taken before crushing.

and she gained forty-five pounds. Sputum remains positive. Patient is up and about and shows marked improvement. The Schilling count at present is of non-infectious type. Elevation of diaphragm before pneumoperitoneum (fig. 3a) was at level of the eleventh rib; after pneumoperitoneum (fig. 3b) elevation of diaphragm was at level of ninth rib.

Case 3. E. M. C., woman, aged 27, entered Mt. St. Rose December 16, 1937, with a diagnosis of far advanced tuberculosis, B, with extensive involvement of the upper three fourths of the right lung and upper half of the left lung with bilateral cavitation. At the time of entrance the patient was two months pregnant. A right pneumothorax was attempted but unsuccessful. Gestation was permitted to continue under careful observation of obstetrician and internist. Before delivery and before pneumoperitoneum was established, the diaphragm was at the level of the tenth rib (fig. 4a). There was a normal delivery on July 20, 1938. Pneumoperitoneum was instituted August 9, 1938, with the object of maintaining the elevation of the diaphragm. There has been a marked clearing of the moisture in both lungs.

A roentgenogram (fig. 4b) taken on March 6, 1939, showed the diaphragm at the level of the eighth rib on the right side and at the level of the ninth rib on the left side. The roentgenogram reveals the lesions to be more clearly defined, indicating fibrosis. She has gained ten pounds since August, feels much better, has no fever and the Schilling count is of noninfectious type. Her sputum, however, remains positive.

Case 4. L. B., woman, aged 24, entered Mt. St. Rose on November 9, 1937, with a diagnosis of far advanced tuberculosis, B, bilateral. A left pneumothorax had been attempted at another hospital in March 1937 and was discontinued in the summer because of the development of a massive hydropneumothorax. A left phrenic crushing was done in September 1937, just previous to entrance to Mt. St. Rose Hospital, and a spread to the right lung developed. On entrance, she had an active involvement of both lower lobes and of the left infra-clavicular region. A right pneumothorax was attempted but was unsuccessful.

A left phrenic crushing was done again on January 7, 1938. A cavity formation developed in the right lower lobe and the patient's general condition became worse. Because of this a pneumoperitoneum was established on May 17, 1938. Roentgenogram (fig. 5a) taken on May 3, 1938, reveals the diaphragm at the level of the tenth rib before pneumoperitoneum was initiated. About six months later (November 7, 1938) a roentgenogram (fig. 5b) reveals the diaphragm at the level of the ninth rib. While under pneumoperitoneum the patient has gained twelve pounds and shows marked

improvement with a normal Schilling count and no fever. Her sputum remains positive.

Case 5. R. L., man, aged 26, entered Mt. St. Rose on July 27, 1935. Case had been diagnosed as far advanced tuberculosis, C, bilateral, since 1929. He was pronounced an arrested case after eight months bed rest. There was a return of symptoms in 1932 and a left pneumothorax was unsuccessfully attempted. He was in a sanatorium in the East for three years on absolute bed rest. Examination at time of entrance to Mt. St. Rose Hospital revealed activity in the entire left lung and the upper third of the right lung. A right phrenic crushing was done on September 18, 1936, and a right on November 17, 1937. A right pneumothorax was instituted at Mt. St. Rose in 1936 but was unsatisfactory. Patient continued on bed rest and became progressively weaker.

On May 13, 1938, a roentgenogram (fig. 6a) showed the level of the diaphragm on the right side at the eleventh rib and on the left side at the level of the tenth rib. The diagnosis at that time was terminating tuberculosis. A pneumoperitoneum was instituted on July 1, 1938. Since then patient has gained thirteen pounds and his appetite has improved. There is much less coughing, physical symptoms show considerable clearing up and the Schilling count is noninfectious. However, his sputum remains positive. A roentgenogram (fig. 6b) taken on November 7, 1938, four months following the initiating of pneumoperitoneum, shows a selective pneumoperitoneum with the elevation of the diaphragm on the left side at the eighth rib.

Case 6. V. S., woman, aged 24, entered Mt. St. Rose on December 30, 1937, as a readmission with a diagnosis of bilateral far advanced tuberculosis, C. A left pneu-

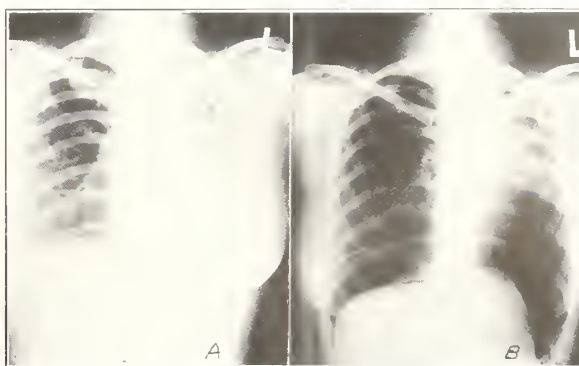


Fig. 8. (Case 6.) A. Roentgenogram a few months after phrenic crushing. B. Selective pneumoperitoneum with the diaphragm at the level of the seventh rib on the left side.

mothorax had been done in 1933 but gradually obliterated itself. This was followed by a left phrenic crushing which was done on January 28, 1938, shortly following her last admission to the hospital. Patient's condition remained stationary.

A roentgenogram taken February 8, 1934, (fig. 7a) showed an obliterating pneumothorax. Figure 7b is a roentgenogram taken before crushing on March 11, 1938. Figure 8a is a roentgenogram taken a few months after phrenic crushing on May 25, 1938. During this period the patient's condition remained stationary with no improvement as to physical condition or symptoms. In July 1938 a pneumoperitoneum was instituted. Since then the patient has shown marked improvement such as gain in weight and absence of fever and has a normal Schilling count. The sputum, however, remains positive. Figure 8b, taken on November 7, 1938, shows a selective pneumoperitoneum with the diaphragm at the level of the seventh rib on the left side.

#### CONCLUSIONS

The accidental observation by Banyai that pneumoperitoneum has a beneficial therapeutic effect in pulmonary tuberculosis has been borne out in our own experiences, both in hospital and private practice. Favorable results also have been obtained by other workers as shown by the numerous reports in the literature during the last two years.

This procedure undoubtedly will have a definite and distinct place in our armamentarium for combating the ravages of this disease. There is a definite indication for its use in all cases in which other methods of treatment have failed or in which such measures are contraindicated by the nature and extent of the involvement present.

Time alone will determine its ultimate value. At present one must have an open mind on this subject and be prepared to evaluate carefully the end results after a sufficient time has elapsed.

Today we are probably safe in stating that this procedure may have a far greater field of usefulness than the phrenic operation and in many instances serve as a substitute to a greater advantage. Certainly it is a more flexible procedure and greater indications for its employment already are apparent. No doubt the diaphragm will be elevated higher if a phrenic crushing is done prior to initiation of pneumoperitoneum.

The psychic effect of this procedure is really remarkable, especially in the far advanced cases. This is much more evident in patients on pneumoperitoneum than in patients getting pneumothorax treatments. The air distending the abdomen, giving the patient visible evidence of his treatment, seems to lend an attitude of optimism to most of these patients.

We do not claim that pneumoperitoneum will cure these far advanced cases nor that it will supplant the more orthodox pneumothorax treatment, but we do say that it relieves toxemia and prolongs life which, after all, is what we as physicians must always strive to do.

#### BIBLIOGRAPHY

1. McGlinn, John A.: Oxygen in the Treatment of Tuberculous Peritonitis, *New York State J. Med.* 88:359 (Aug. 22) 1908.

2. Meeker, H. D.: A Case of Tuberculous Peritonitis Treated by Intraabdominal Use of Oxygen, *Internat. J. Surg.* 25:247, 1912.
3. Weil, P. E.: Treatment by Inflation of Oxygen of Tuberculous Affections, *Brit. M. J.* 2:976 (July-December) 1921.
4. Fritz, Sargo W.: Therapeutic Pneumoperitoneum in Tuberculous Peritonitis, *Med. Klin.* 1513 (December) 1921.
5. Stein, A.: Oxygen Inflation of Peritoneal Cavity in Tuberculous Exudative Peritonitis, *J. A. M. A.* 718 (March 12) 1922.
6. Mattick, W. L.: Intraperitoneal Oxygen Inflation in the Treatment of Ascitic Tuberculous Peritonitis, Report of a Case, *Am. Rev. Tuberc.* 473 (January) 1924.
7. Gilbert, O. M.: Pneumoperitoneum in the Treatment of Tuberculous Peritonitis, *Am. Rev. Tuberc.* 479 (January) 1924.
8. Banyai, A. L.: Pneumoperitoneum, *Dis. of Chest* 8 (December) 1937.

## CLINIC PRESENTATION

### PYELONEPHRITIS

### CHRONIC ARTHRITIS

### AURICULAR FIBRILLATION

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This clinic will consist of the presentation of patients and case histories illustrating the important clinical features of the following diseases: (1) Pyelonephritis with cardiovascular changes. (2) Chronic arthritis with a brief discussion of the etiological factors, management and results. (3) Auricular fibrillation of twenty-five years' duration.

#### PYELONEPHRITIS WITH CARDIOVASCULAR CHANGES

Before presenting the first patient I will give a brief abstract of the clinical features of two similar cases. The first is a clinical report given by Dr. Reginald Fitz at the meeting of the American College of Physicians at New Orleans in April 1939. The case was that of marked hypertension due to unilateral pyelonephritis with apparently complete recovery following nephrectomy.

#### REPORT OF CASE

Case 1. A man, aged 40, consulted Dr. Fitz in May 1937 complaining of nervousness and a feeling of tiredness. Examination showed nothing except a systolic blood pressure of 200. He later developed a severe tonsillitis with a temperature of 104 F. Two weeks after the tonsillitis subsided he began to have convulsions, the urine contained macroscopic blood and pus and the blood pressure reading was 230/130. The blood chemistry remained normal. After a few weeks, the urine merely showed a few blood and pus cells and the convulsions stopped but the blood pressure remained high and the patient began to have severe headaches. A pyelogram at this time showed nothing unusual.

A year later, with headaches persisting and blood pressure still high, another pyelogram was made. Apparently during the year one kidney had increased in size and the other had diminished. The smaller kidney was removed; it was a congenitally atrophic kidney with superimposed pyelonephritis. His headaches subsided almost immediately, the blood pressure fell to normal promptly and a year later, in April 1939, the blood pressure continued well within the range of normal.

A personal communication from Dr. Fitz within the last few days states "the patient's blood pressure has continued normal to date."

Clinic presented before the Jackson County Medical Society, January 23, 1940.



The significance of this clinical report by Dr. Fitz hardly can be overestimated. It shows conclusively that certain cases heretofore classified as "essential hypertension" may be cured by instituting the proper clinical approach. The assumption that the cause of this patient's hypertension would be removed by nephrectomy was substantiated by the clinical results. A few of the important points deserving emphasis in this extremely interesting case are:

(1) Confirmation of Goldblatt's experimental work which showed that a hormone or some internal secretion is formed in an ischemic or diseased kidney that may cause hypertension.

(2) The diagnosis was made from the clinical history, the urinary findings and a pyelogram indicative of unilateral pyelonephritis.

(3) Severe attack of tonsilitis followed in two weeks by hematuria, convulsions and a marked elevation of blood pressure.

The second case history is that of a patient who is now on the medical service at the University of Kansas Hospital. Knowledge of the findings and results in the case reported by Fitz made the diagnosis of this patient possible.

#### REPORT OF CASE

Case 2. A man, aged 37, entered the hospital November 11, 1939, complaining of orthopnea and dropsy. The chief abnormal findings were paroxysmal dyspnea, apex beat one inch to the left of the nipple line, gallop rhythm, generalized anasarca, enlarged and tender liver and blood pressure 150/125. His blood chemistry and eyegrounds were normal. Urinalyses showed many pus cells, albumin 1 to 3 plus and the specific gravity ranged between 1.007 and 1.019. His present illness began in May 1939 with nightly attacks of cardiac asthma although he continued to work until August when he developed effort dyspnea and edema of the ankles.

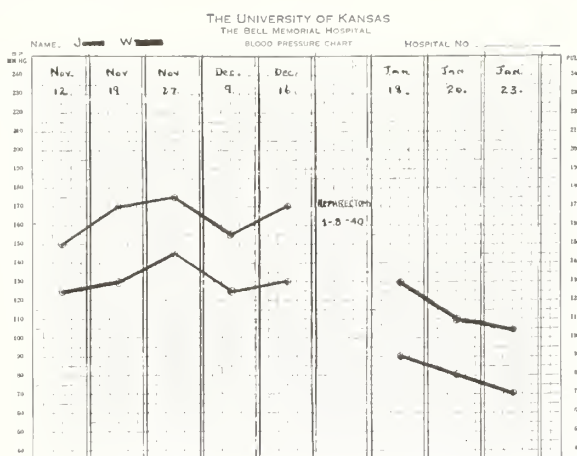
The past history revealed that in 1927 he had been operated on for an abscess of the left kidney, a portion of which was removed, but the wound failed to heal. A year later another futile attempt at nephrectomy was made. Following this the incision healed promptly and he was symptom free until the onset of his nocturnal dyspnea eight months ago.

Following admission to the University of Kansas Hospital, his management consisted of digitalis, diuretics and two or more hypodermics of pantapone daily for relief of his dyspnea. In spite of these therapeutic measures his dyspnea persisted and the blood pressure rose, being recorded on November 27, 1939, as 175/145, although there was a slight reduction in his dropsy.

The diagnosis was hypertension due to unilateral pyelonephritis and, although he was considered to be anything but a good surgical risk, his downward trend during the period of observation indicated that recovery was improbable with the cause of his hypertension persisting. Accordingly, a nephrectomy was done on January 8, 1940. The conclusions by the pathologist were: "Large infected hydronephrosis with pressure atrophy."

Following a stormy postoperative course, the pressure began to fall on January 18, and two days later was 110/80. The patient is now symptom free, the gallop rhythm has disappeared and roentgen ray films show the heart has decreased 2.5 cm. in the transverse diameter. (Fig. 1.)

The fact that his dropsy and dyspnea disappeared coincidentally with the fall in his blood pressure would



indicate that his myocardial insufficiency was due largely, if not solely, to overwork of the heart from the hypertension.

Case 3. This man, aged 39, was first admitted to St. Luke's Hospital on September 12, 1939. He was dismissed from the hospital on November 25, 1939, and re-admitted January 15, 1940. When admitted in September, his complaints were pain in the heart, palpitation and sore throat. On examination the heart was enlarged 20 per cent with the point of maximal impulse one inch outside the nipple line and the blood pressure was 160/105. Examination of the tonsils showed a typical acute follicular tonsillitis. The electrocardiographic changes were consistent with the diagnosis of coronary occlusion. Repeated urinalyses during the eleven weeks he was under observation revealed normal variation in the specific gravity, 20 to 50 red cells per high power field and a few leukocytes. Cultures of the urine showed bacillus coli and staphylococci. Blood examination showed hemoglobin 91 per cent, red cells 4,940,000, leukocytes 9,850. Blood chemistry remained within the normal range. The sedimentation rate was 18 mm. in one hour.

His illness began in November 1938 with an attack of auricular fibrillation lasting from eight to ten hours. On December 15, 1938, he had a severe attack of chest pain and the diagnosis of coronary occlusion was made by his family physician. On January 15, 1939, he had an attack of renal colic followed by hematuria and he has had red and white blood cells in the urine since then. For the last year, he has had temperature bouts every two to four weeks and frequent attacks of auricular fibrillation.

When he was first admitted to the hospital, he was thought to have coronary occlusion, auricular fibrillation, infected tonsils and probably infarction of the kidney. However, after a few weeks' observation and having in mind Fitz's clinical report of the complications of pyelonephritis, the question arose if the primary lesion in this patient might be an infected kidney. Accordingly, a number of both intravenous and retrograde pyelograms was made and each showed alteration in the pelvis of the left kidney. There was no evidence of urinary stasis.

From these observations I have taken the view that all of his conditions are closely related and in the following sequence: (1) chronically infected tonsils, (2) unilateral pyelonephritis, (3) hypertension, (4) coronary atheroma causing myocardial infarction and auricular fibrillation.

Although the findings apparently justify the diagnosis of pyelonephritis, the etiologic relationship of this condition to infected tonsils is only problematical.

While in the hospital during the fall, this patient had

a tonsillectomy, was given digitalis, quinidine, urotropin and fluids were forced. When dismissed in November his condition was unchanged except that the attacks of fibrillation were of shorter duration and occurred less frequently. The decrease in the rhythmic disturbances of his heart coincided with his tonsillectomy.

On admission last week, his condition was much the same as when he was dismissed in November. Although he has gained a few pounds in weight, feels better and has fewer attacks of fibrillation, his heart is still dilated, the urine still shows blood and pus cells and the pyelograms are unchanged.

The most striking observation during the last week is the marked fluctuation in his blood pressure which varied between 120/75 and 155/110 within a few hours.

The question arises: Should this patient have a nephrectomy? My feeling is that such a procedure is contraindicated at this time. His heart is badly dilated and removal of a kidney, assuming this to be the cause of his coronary disease, cannot correct the damage that has already been done. Again, he has a chance to get along on medical treatment.

Just a word of caution against overenthusiasm in an attempt to attribute all cases of hypertension to pyelonephritis. This has been found to be the cause in only about 10 per cent of cases and in less than half of these the condition was unilateral.

The recognition that infection of a single kidney may cause hypertension and arterial atheroma represents one of the most important advances in medicine in the last year. The treatment of hypertension by removal of a unilateral pyelonephritic kidney is on a more scientific basis than adrenalectomy or section of the splanchnic nerves.

#### CHRONIC ARTHRITIS REPORT OF CASE

Case 4. A woman, aged 67, was seen November 13, 1939, complaining of pain and aching of all her joints. The onset was eighteen years previous with spells that she was told were "rheumatic fever." She had three or four of these spells each year and for the last four or five years has not been entirely free from pain and stiffness of the joints between spells. She managed to get about and do part of her work until March 1939 when she became 90 per cent incapacitated.

Her past history revealed that from the age of 30 to 40 she had one or two attacks each year of severe epigastric pain typical of biliary colic; but she has had no attack for twenty-seven years and has had no gas or digestive disturbance. A tonsillectomy was done seventeen years ago. Fifteen years ago she had all her teeth extracted without any effect on the arthritis.

Physical examination revealed involvement of practically all joints. The left wrist and right knee were quite swollen and tender, the middle joints of the fingers on both hands were swollen and tender and she was unable to make a fist beyond 50 per cent. There was marked limitation of motion of both shoulders. She was also quite tender in the gallbladder region. Urinalysis showed specific gravity 1.012, no albumin nor sugar, and 2 to 3 pus cells and an occasional red cell per high power field. Blood examination showed hemoglobin 85 per cent, red cells 4,460,000, leukocytes 13,400. Roentgen ray pictures showed a number of shadows in the region of the gallbladder.

On November 20, 1939, she was operated on and a thickened gallbladder full of stones was removed. A few days after operation, she was able to put both hands on top of her head (which she had been unable to do

for nine months) and could make a moderate fist with both hands. On dismissal from the hospital three weeks later, she was still free from pain or swelling of any of the joints. She intentionally was not given either sodium salicylate or aspirin while in the hospital.

This would seem to be a case of chronic arthritis with the focus of infection in the gallbladder. Although the gallbladder is not a common focus of infection producing systemic disease, the possibility of such being the case often is overlooked. I have seen a few similar cases and in each instance the symptoms of arthritis began to disappear within a few days following cholecystectomy. The results in the few cases seen were so striking and immediate that it was a question if the operation did not cause a bilirubinemia. However, in this particular case, the icterus index was never above 8 before or after operation.

The main object in reporting this case is to emphasize that infection in the gallbladder may be the etiologic factor in such systemic diseases as arthritis and even arterial atheroma. In this connection it may be significant that Helwig and Breyfogle (personal communication) found 33 per cent of 162 cases of coronary occlusion had gall stones.

#### REPORT OF CASE

Case 5. This patient was admitted to the hospital seven weeks ago complaining of arthritis, nasal obstruction and a feeling of rawness on the right side of the throat. She is a housewife in her early 40's and has two grown daughters. Her periods have always been regular.

The arthritis came on suddenly in the night in the left wrist in March 1933. The next morning the wrist was quite painful, red and swollen. In a short time all the joints, except the hips, became involved successively. At no time since the onset has she been entirely free from trouble. The patient insists that there has been a premenstrual aggravation of her arthritis since the onset. During the last year, she has been gradually getting worse and for the last four or five months has had constant pain which was so severe at night that she was unable to get more than three or four hours sleep.

She has noticed rawness in her throat for about two years and during this time has been greatly annoyed by a bad odor in her throat which she thought came from her nose. The nasal obstruction came on coincidentally with her arthritis and the patient thought that the arthritis probably caused her nose condition.

In 1934, six years ago, she noticed a bean sized lump (probably a lymph node) in the region of the right parotid gland that disappeared in about six months.

Her symptoms on admission were stiffness and pain of her shoulders, elbows, wrists, proximal and middle joints of the fingers, knees and left ankle. The right knee and left ankle were considerably swollen and hot. She had an artificial denture above and below with a tonsillar remnant of considerable size on the left side. There was a red area about one inch long behind the right pillar of the palate. There was a bean sized tender lymph gland at the angle of the jaw on either side. Pelvic examination revealed an erosion of the cervix of considerable size. Roentgenograms of the nasal sinuses showed cloudiness of the ethmoid cells on both sides.

Laboratory tests showed hemoglobin 83 per cent, red cells 4,460,000, leukocytes 5,600. Wassermann and Kline tests were negative. Blood calcium was 11.4, phosphorus 4.0, cholesterol 152, uric acid 3. Gastric acidity was



free acid 18, total acidity 28. Urine tests showed specific gravity 1.018, no albumin or sugar, and 1 to 2 white cells per high power field. Basal metabolic rate was plus 2 per cent. The sedimentation rate of red corpuscles on admission was 24 mm. in thirty minutes.

The past history revealed the following: (1) frequent sore throats until tonsillectomy in 1924; (2) all teeth extracted between 1935 and the summer of 1939 with no relief; (3) January 1937, in a hospital for a month, took sodium salicylate and hyperpyrexia treatments and felt better; returned to the hospital six months later and took hyperpyrexia treatments for three weeks but no medicine; result, much worse; (4) January 1938, Claremore, Oklahoma, hot baths; result worse; (5) June 1938, three weeks at the Mayo Clinic; tonsil stub on the right side removed; result worse; (6) August, September and October 1939, hot baths at Thermopolis Springs, Wyoming; result worse; (7) November 1939, cervix cauterized for infected nabothian cysts by her family doctor.

She is a woman in a fair state of nutrition, with good color and weighing 138½ lbs. There is an atrophy, about grade 2, of the interosseous muscles of both hands. The swelling and tenderness of the middle joints of the fingers that she had on entry to the hospital has disappeared but there are Heberden's node of considerable size on the middle and ring fingers of the right hand and the index and middle fingers of the left hand. There is not more than 50 per cent motion of either wrist, obviously due to fibrous ankylosis. These observations show that this patient has both an atrophic as well as hypertrophic arthritis which is seen so frequently, justifying belief in the "unitarian idea" of arthritis, at least in many cases.

Since this patient is not anemic, neither fat nor thin, and metabolism, blood calcium, blood uric acid, blood cholesterol and gastric acidity are normal, false teeth in both jaws and a history of two tonsillectomies, she could easily be considered by some authorities on rheumatism as a case of idiopathic arthritis. This viewpoint is not acceptable, however, due to the following facts in her clinical history and in our findings: (1) Her arthritis began suddenly in the night with pain, swelling and redness of her left wrist. (2) The sedimentation rate of her red corpuscles on admission was twice normal, which later fell to normal. (3) She complained of pain and rawness on the right side of her throat and five years ago had had an enlarged tender parotid lymph gland on the right side. (4) She has tender anterior cervical lymph nodes on each side. (5) There is cloudiness of the ethmoidal cells on the roentgenogram.

These findings justified the probable diagnosis of an infectious arthritis. The only focus found was in the ethmoid cells, with the additional possibility of infected nabothian cysts.

While in the hospital, this patient's management was as follows: (1) Medication with sodium salicylate, 175 to 250 gr. a day for two days and 40 to 50 gr. of aspirin on the third day. (2) On December 26, 1939, removal of left tonsillar stub and adenoidectomy. (3) On January 8, 1940, ethmoidectomy (revealed thick pus in the cells on the right side but none on the left.) (4) Active exercises of her fingers, wrists, elbows and shoulders.

She has been practically free from pain since the third day on this management. Although she still has some swelling of her right knee, less than 50 per cent of that on admission, and stiffness of her other joints, I think I can conclude that she is definitely improved. She says that if she can remain as she is, free from pain, the rest of her life, she will be quite happy; but I am quite hopeful of still further and definite improvement if she continues salicylate and aspirin in order to make active motion of the joints possible.

Of course, patients cannot be expected to use their joints and prevent contractures if the joints are splinted by spastic muscles; and the pain and muscle spasm can

be relieved in most cases, as it has been in this case, by adequate doses of sodium salicylate.

Although impossible to be positive about the etiology, certainly no causal factor was found except the infection in her nasal sinuses and in her throat.

#### AURICULAR FIBRILLATION OF TWENTY-FIVE YEARS' DURATION

Case 6. This patient is now 62 years old. He was first seen in 1914 with auricular fibrillation. His heart rate at that time varied between 120 and 130, and was persistently irregular. His only complaints were fluttering of the heart and weakness of his legs on hill climbing. He had no dropsy and there was no evidence of disturbed function of any of the fundamental properties of the heart muscle except rhythm. The cause of the fibrillation was not determined. Overexertion was considered as a possible etiologic factor since he dated his trouble from an attack of edema of the lungs that came on immediately after swimming in cold water.

Soon after the diagnosis was made, he went to the Rockefeller Institute and was one of the first patients in that institution to be given quinidine, which restored the normal rhythm only temporarily. On returning to me, he was given digitalis and advised to continue it the rest of his life in order to hold down the rate and thus prevent dilatation from overwork due to the rapid irregular contractions of the ventricle.

He continued his digitalis for sixteen years and during all this time was able to work and engage in ordinary activities. He then began going from doctor to doctor and clinic to clinic, the digitalis was stopped and effort dyspnea and dropsy soon developed.

He was next seen in December 1933, sitting in a chair where he had been day and night for a year and a half. His face was expressionless, the lips were cyanotic, and he had approximately 100 lbs. of fluid in his tissues, at least one fourth to one third of which was in the scrotum. All hope of using mercurial diuretics intravenously had been abandoned by his former physicians because of thrombosis of all superficial veins. Because of orthopnea, he had taken 7½ gr. of pantapone hypodermically every four hours for two years.

On ammonium nitrate, salyrgan and digitalis, his weight decreased from 241 pounds in December 1933, to 139 pounds in June 1934. By careful technic, we were able to give 150 injections of salyrgan over a period of two years, all in the same vein.

For the last three or four years, he has taken eight tablets of digitalis a week and an occasional dose of salyrgan. He is able to get about and does some work. In fact, he flew to Kansas City yesterday from Miami, Florida, in order to be presented at this clinic.

The most important features in this case, therefore, are: (1) auricular fibrillation of twenty-five years' duration; (2) no dropsy or other evidence of impairment of tone of the heart muscle until after digitalis was discontinued; (3) reduction of 100 pounds in weight in seven months, largely from the use of salyrgan, and (4) excessive use of pantapone for over two years although, when dyspnea was relieved, the use of the drug was voluntarily discontinued.

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#### EXPLAINS THE TERM "MUSCLE BOUND"

Explaining the term "muscle bound," *Hygeia, The Health Magazine* says that it is a descriptive but not a scientific term "popularly applied to an abnormal muscular development which may restrict quick and supple movements, especially of the arms and shoulders. When a muscle is used a great deal, it tends to become shorter and hence to produce a strong pull on weaker sets of opposing muscles, causing in certain cases some deformity.

## THE CRIPPLED CHILD

ARCHER O'REILLY, M.D.

ST. LOUIS

A program for the crippled child must be well rounded, begin with medical and surgical treatment, include educational and vocational training and finally fit him to become a useful citizen who can take his place in the community in spite of his handicap. This can be done only, however, by all those interested working hand in hand.

The first important step in this program is to find the crippled child. This is not always an easy task, however, especially in rural communities where there are prejudices and fears; with parents who would prefer to see the child dead rather than operated upon; with parents who are ignorant of the benefits of surgery and who do not know where to turn for help. It is only by the concerted efforts of all that these children can be found, and it takes much more effort to persuade the parents to let the children receive treatment.

Orthopedic treatment is the first and most important step in a plan of rehabilitation for the crippled child because careful medical care is essential to restore the patient to as nearly normal a condition as possible. The nearer normal the patient, the easier are the other parts of the program.

All the crippling conditions are slow and chronic, lasting from months to years. Any injury or disease of the bones, joints or muscles will probably result in some crippling, but with careful treatment the handicap may be so lessened that the patient may be able even to do hard work. In some cases, on the other hand, as in severe cases of infantile paralysis, the damage may be so great that the patient will be disabled totally. One can not expect the orthopedic surgeon to do the impossible, but he can prevent the development of deformity. Most orthopedic cases, if they are neglected, result in this condition. Joints become flexed, bones distorted and twisted so that their use is often impossible and the patient becomes a hopeless cripple. This tendency to deformity is seen in congenital defects like clubfoot. These are easy to correct in the infant but become progressively more difficult as the patient grows older. In acquired conditions as tuberculosis of the joints, flexion deformities are most common; this is also the rule in infantile paralysis. The correction of deformity is not only important from a functional point of view but also from a cosmetic one. A bad deformity may affect a sensitive patient to such an extent that his capacity for work may be seriously handicapped.

There are also some deformities such as lateral curvature of the spine that come on later in the child's life. These are insidious in onset and may have serious and unsightly results. The best method of prevention is by early and regular examinations in the schools. Faulty posture is another condition that may be a serious handicap and one that should be found in the school examination. A survey

of several hundred school children made by the tuberculosis society several years ago showed a remarkably large proportion of school children with bad posture and scoliosis in varying degrees of seriousness. This survey was a cross section of the school children in St. Louis.

Orthopedic care of the crippled child should begin immediately after the onset of the condition. Correction of congenital deformities should be begun immediately after birth. In most cases early treatment means hospitalization. The treatment of tuberculosis of the joints and other diseases means rest and support, often for many months. Infantile paralysis also may mean months of rest in bed.

In tuberculosis of the joints the best result that one can hope for is a stiff joint in the best functional position. Ankylosis may be hastened by operation in certain cases. In other diseases of the joints and in infantile paralysis, function may be improved by physiotherapy. In addition to regular physiotherapy many hospitals and schools have swimming pools where underwater therapy is given. A swimming pool is expensive and consequently its use is restricted. There are substitutes for the swimming pool, however, and good work can be done without one. A good physiotherapy department should be a part of every orthopedic hospital.

Occupational therapy is a valuable adjunct in the treatment of orthopedic cases. It is not a panacea and will not give motion to joints that are ankylosed nor give power to muscles that are completely paralyzed. In the early stages it supplies work and amusement to the bedridden and, by alleviating the stay in bed, makes the patient easier to treat. Later occupational therapy, by making work and exercise interesting, is able to secure more rapid results. Occupational therapy is what its name implies, a treatment by occupation. It never should become commercial. When one begins to produce salable objects the therapy angle disappears. In the later stages, occupational therapy can be used as a step to prevocational training.

The orthopedic surgeon sees many children who have become deformed through lack of treatment or because parents have not cooperated with the doctor. Many of these can be helped and often restored to a fair degree of usefulness. An operation, however, usually is necessary to correct deformities; tendons must be lengthened, bones cut and often other complicated operations performed. All of these require weeks and months of hospitalization and valuable time is lost. Deformities must be corrected, however, before any other form of reconstruction is attempted; it is impossible even to apply braces to deformed limbs. That is another reason why deformity should be prevented.

Orthopedic surgery, however, is not negative. There are numerous steps that can be taken to increase the use and function of joints and muscles. Stiff joints under certain conditions can be mobilized by arthroplasties. Function in some cases



can be increased by transplanting tendons, substituting a good tendon for a paralyzed one. In infantile paralysis there are a number of operations that stabilize joints, thereby allowing the patient to get about without braces or with a minimum of braces. Legs can be lengthened or shortened and there are many other operations that tend to make the patient more efficient.

The chronicity of the average orthopedic case raises a serious question. How can they all be hospitalized and given the proper care? One of the most satisfactory solutions is to have a convalescent home to which the children can be sent. By sending patients on to a convalescent home more beds in the hospital are made available. The cost of upkeep is less. Children are in the convalescent home long enough to permit the establishment of a school so that the vitally important education will not be neglected. At this time the child can be studied for some vocational interest to be used later in vocational training. They also are receiving physiotherapy and occupational therapy.

City children who are able to go home are discharged and go to the clinic or to the physician at regular intervals for follow-up and treatment. This problem has been greatly simplified by the two schools for crippled children in St. Louis, the Elias Michael for white children and the Turner School for Negro children. In these schools the children are able to obtain physiotherapy, they are fed and are given rest periods. They are sent to the clinic or the doctor at regular intervals so that their physical progress can be followed carefully.

At present, there is no convalescent home in St. Louis. The problem of securing follow-up and after-care for rural children is a serious one. If this is not done, much of the beneficial work of the hospital will be lost. The problem has been solved partially by putting these children in foster homes from which they are brought in for regular treatment.

There are some children who are home bound, either because they are convalescing or are too severely handicapped to get about. The St. Louis Society for Crippled Children has arranged to supply a visiting teacher for these children. As a result many have kept up with their classes and have been able to return to school without having lost several years.

Vocational training is not necessarily a part of orthopedic treatment but it is a subject that the orthopedist should have in mind and one on which he should be able to advise. His judgment and knowledge of the patient is often important in deciding what the patient can do.

In Missouri the orthopedic care of the crippled child under 15 has been placed under the State Crippled Children's Service. This is supported by state funds matched by Social Security grants. The children are treated, at present, in St. Louis, Columbia, Kansas City and St. Joseph. The state is divided into seven districts in each of which there is

a field nurse. Her duties are to make surveys in her counties, find the crippled children and hold clinics; see that the children are sent to the hospital and that after-care is received. The service has been doing good work but is much handicapped by lack of money.

There is no state provision for children more than 15. The Missouri Society for Crippled Children has undertaken to provide this care. It is interested in all the problems of the crippled child from hospitalization to education.

#### SUMMARY

The orthopedic cripple is severely handicapped in the use of his bones, joints and muscles as the result of disease, injury or some birth defect. Orthopedic treatment is most important because early treatment lessens the severity of the condition and prevents deformity which often may result in complete disability. Orthopedic treatment restores the patient to as nearly a normal condition as possible and thus renders it easier for him to secure an education and vocational training and thus fit him to become a useful citizen who can take his place in the community in spite of his handicap.

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## SUBDURAL HEMATOMA

WITH SPECIAL REFERENCE TO ITS SURGICAL TREATMENT  
WITH AN ANALYSIS OF 245 CASES

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As far as can be determined, subdural hematoma was first identified in 1559 when Ambrose Pare\* described the death of Henry II of France who was wounded in a tourney. It remained essentially a pathologic curiosity until the middle of the nineteenth century when it became a subject of general discussion by pathologists. Various theories have been proposed on both its nature and its etiology.

\*Les Oeuvres d'Ambrose Pare. Paris, G. Guon 1579, Book 9, Chap. 9, pages 342d and 343a. Translated by Miss Doris Brophy; Courtesy of the Osler Library, Montreal, Canada.

"All these things, or most of them, we saw happen to the late king Henry (II) recently dead, who in a recent tourney received a severe blow with a lance on the body which was the cause of the scalp injury, and the contracoup blow given him above the right eyebrow. It tore the muscle and skin of the forehead almost to the bone transversely as far as the inner canthus of the left eye, and with it many small fragments or splinters from the lance lodged in the substance of the said eye, without fracturing the bone. Therefore, because of such displacement and shaking of the brain, he died the eleventh day after having been struck. After his death, they found on the opposite side of the head about the center of the suture of the occipital bone, a quantity of blood between the dura mater and the pia mater; an alteration in the substance of the brain which was native color or yellow, for an area about the size of one inch; at which site there was beginning 'putrefaction.' These were sufficient causes for the death of said Seigneur and not the wound to the eye alone, which no one wished to believe the cause of death; because we have seen many who received greater blows than this one on the eyes and did not die from them."

The condition has been known as a surgical entity for more than two centuries. Guthrie<sup>6</sup> reported two cases trephined and cured in the eighteenth century, one in 1730 was bilateral and the other in 1766 was a so-called post-traumatic epileptic case.

Since the publication of the elaborate works of Bowen<sup>6</sup> in 1905 and Putnam and Cushing<sup>70</sup> in 1925, subdural hematoma has become a definite surgical entity and the principles of its treatment now are established definitely. In spite of this, the mortality rate has remained high and in many instances results of surgery have not been satisfactory. Therefore, a fairly comprehensive summary of diagnostic and therapeutic procedures may be of use.

Two hundred forty-five cases, most of which have required operative procedures, have been analyzed, twenty-four occurring in the practice of one of the authors (Dr. Klemme) and 221 appearing in the literature.

**Definition.**—Subdural hematoma is an extra-arachnoid subdural cystic collection of blood which may be fresh or of long standing. In either case, the whole mass develops a fibrous tissue capsule after a short interval. In the early stages this is only a film of fibrous tissue but, as the condition becomes more chronic, it becomes thick and vascular. Because the fibroblastic and capillary outgrowths come from the dura, the side adjacent to this membrane attains a greater thickness than that facing the arachnoid. The cyst at first contains blood which later becomes a chocolate colored fluid.

**Incidence.**—This condition was found to be most common in adults (82 per cent of cases), 87 per cent of whom were males (fig. 1).

**Diagnosis.**—While a definite diagnosis of subdural hematoma cannot be made without operation, there are some points which make possible a probable diagnosis. The most valuable are the initial symptoms of headache and mental change, considered individually or together. These occur in the alert adult patient in 84 per cent of the cases. More than one half of the remaining cases are either stuporous or comatose when first seen. Headache occurs in 79 per cent of the adult patients; it is unilateral in 13 per cent being on the same side as the lesion in two thirds of these cases.

A history of head injury followed by bizarre neurological signs is strongly suggestive of subdural hematoma. The injury may be slight or severe, recent or old. In the present series, the interval between the injury and the onset of symptoms varied from one hour to twenty years.

Increased intracranial tension manifests itself by the usual signs and symptoms. Their incidence in

this entire series is as follows: headache, 65 per cent; vomiting, 40 per cent; choked disks, 40 per cent; coma, 35 per cent; slowed pulse, 17 per cent; bilateral plantar extensor response, 14 per cent; impaired respiration (Cheyne-Stokes, stertorous or slowed), 11 per cent; stupor, 9 per cent; relative intracranial hypertension, 8.3 per cent; diplopia, 6.2 per cent, and absence of all abdominal reflexes, 6.2 per cent.

There may be early signs of pressure at the base of the brain on the cerebral peduncles which may be pressing against the tentorium of the cerebellum. This compression simulates cerebellar herniation at the foramen magnum. When compression takes place there may be pressure on either one or both of the cerebral peduncles or one or both of the third nerves. A hemiparesis with dilated and sometimes fixed pupil may result. Relatively infrequently does one find these two signs occurring unilaterally on the side of the lesion. Of 200 adults in this series, fifty-three or 26.5 per cent had unequal pupils; twenty had dilated pupils with lesions on the opposite side or on both sides.

Though frequently present localizing signs in the form of palsies, hemiplegias and irregular reflex responses are not reliable guides to the site of the lesion.

**Special Diagnostic Procedures.**—(1) Ventriculography is the most reliable diagnostic procedure. It usually can be performed with only one perforation of the skull; its percentage of accuracy is high and there is practically no shock or operative mortality from the procedure. (2) The multiple burr holes procedure is as unwarranted for locating a subdural hematoma as it is for locating a tumor of the brain and the chance of success is equally poor for each new hole means additional shock to the patient and a waste of time. (3) Lumbar puncture as a diagnostic procedure for subdural hematoma is without anatomical justification; it has been directly accountable for death in eight cases reported in this series and was followed by an aggravation of symptoms in nineteen others.

Trotter<sup>80</sup> has shown that in the presence of a mass encroaching upon the contents of the skull the removal of even a small amount of spinal fluid is dangerous as the blood supply to the brain is already so diminished that slight changes of cerebral pressure may cause an extreme and even fatal anemia of the brain.

Spinal fluid pressure is variable and never reliable. In the presence of large intracranial masses it may be extremely low or high.

The cell content of the spinal fluid is not important because there is no direct connection between the subarachnoid and subdural spaces. Therefore, spinal fluid examination is indicated only when there is a question of meningitis, encephalitis or cerebrospinal syphilis.

**Treatment.**—Subdural hematoma should be treated like other tumors of the brain. When the

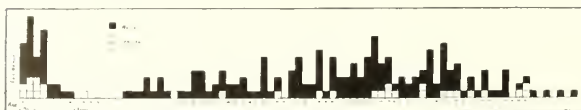


Fig. 1. Age and sex incidence.



condition is suspected, a ventriculogram should be followed by an osteoplastic craniotomy.

There is no reason to change the usual method of handling intracranial lesions because a subdural hematoma is suspected. Multiple burr openings for diagnostic and therapeutic purposes, which many times necessitate additional ventriculography, would be frowned upon by it advocates if the identical procedure were carried out when dealing with a cyst or a tumor of the brain. When the condition of the patient renders him a poor operative risk, the air injection can be followed temporarily by a subtemporal decompression.

**Operation.**—A large osteoplastic flap should be used whenever possible. If the patient is too ill to stand so extensive a procedure, a subtemporal decompression may suffice. However, removal of adherent, tenacious, calcified and organized clot, and of the greater portion of the membrane of the hematoma, can be accomplished only through a large opening. This procedure also enables the surgeon to control all bleeding points and leaves a decompression which relieves postoperative cerebral edema.

The necessity for the removal of most of the membrane is best understood by studying the recent works of Gardner<sup>28</sup> and Zollinger and Gross.<sup>8,6</sup> These authors clearly demonstrate that the cyst membrane acts as a semipermeable membrane. The osmotic tension of the bloody fluid within the hematoma is greater than the tension of the spinal or tissue fluids; consequently, these fluids are drawn through the membrane causing the hematoma to increase in size. If the greater portion of this membrane is removed, the hematoma can no longer reform.

It is most important that the wound be drained for from twenty-four to forty-eight hours. The objection to drainage, the belief that these wounds are especially susceptible to infection, is not justified. With proper postoperative technic, there is little danger of infection occurring. For years other craniotomy wounds have been drained successfully and there is no reason why drainage should not be done when there is a definite physiological reason for it. Drainage serves three purposes: (1) it removes all subdural fluid which cannot be directly absorbed; (2) it decompresses in case postoperative cerebral edema develops, and (3) it permits the collapse of the hematoma cavity until adhesions form and obliterate the cavity.

**Postoperative Treatment.**—Occasionally the brain does not expand following the removal of a subdural hematoma. This failure probably is due to a generalized dehydration of the tissues which has occurred previously, either before or at the time of the operation. Unless the fluid is promptly restored, these patients may remain stuporous, develop hyperthermia and die. Mild cerebral edema must be produced at once by forcing fluids<sup>32, 62</sup> and by increasing the sodium chloride intake.<sup>5</sup>

For example, in one of our cases hypotonic intravenous fluids, subcutaneous saline and sodium chloride by mouth were forced during the first twenty-four hours until the wound began to bulge and mild choking of the disks was noted. The drain was then removed and the patient's fluid intake limited to 1500 cc. per twenty-four hours. His postoperative course was exceptionally good.

**Operative Mortality.**—There were 203 cases of operation for subdural hematoma reported in this series; forty-eight (23.5 per cent) of these died. Of the twenty-four cases, twenty-three were operated upon, three (13.1 per cent) of which died. The total operative and nonoperative mortality of the whole series is 28.1 per cent.

#### REPORT OF CASES

Case 1. R. A., aged 15 years, admitted to Barnes Hospital on February 20, 1934, giving a history of having been struck in the left temple with a baseball three years previously. For the previous six months he had been suffering with a persistent headache. During the last five weeks there had been double vision. Immediately preceding his entrance, vomiting had been associated with the headache.

On admission he presented the following findings: staggering gait, complete left third nerve paralysis, facial weakness of right central type, diplopia and a bilateral positive Oppenheim sign. His temperature was 99.3 F., pulse 84, respiration 20 and blood pressure 110/70.

Roentgenograms of the skull showed increased convolutional markings; ventricular air injection showed the ventricles shifted to the right.

Under avertin, local and ether anesthetics, a temporoparietal osteoplastic flap was made and a large tenacious hematoma was exposed extending from the floor of the frontal fossa up along the sylvian fissure. This was completely evacuated but with difficulty; the clot was so tough that it could not be irrigated away and required a bone flap for removal. The wound was closed with drainage.

Except for the reopening of the wound to control bleeding, one convulsion and some aphasia the postoperative course was uneventful.

Case 2. L. C., aged 56, was admitted to the Missouri Baptist Hospital on June 8, 1934. His history showed that four years previously he had been struck by a wash boiler on the head. For the three weeks preceding admission to hospital he had had periods in which he would have definite mental change, aphasia and tremor of the hands with forced movements. When his mind was clear he complained of headache.

On admission he was stuporous and aphasic and suffered jerking movements in the right upper extremity. There were bilateral Babinski signs, absence of abdominal reflex, bilateral ankle clonus, positive Kernig sign and rigidity of the neck. His temperature was 98.6 F., pulse 80 to 90, respiration 20, blood pressure 136/104, white blood count 11,650.

A ventriculogram was performed under avertin and local anesthesia which revealed a shift of the ventricular system to the left, particularly in the frontal portion. The ventriculogram was followed by a left frontal osteoplastic craniotomy with complete evacuation of hematoma and membrane and with closure with drainage. The clot was old and tenacious and could not be irrigated away; it could have been removed only through a large opening.

The postoperative course was uneventful.

## CONCLUSIONS

1. The initial symptoms of headache or mental change, or a combination of these two, occur in the moderately alert adult patient with subdural hematoma in 84 per cent of cases.

2. The general signs of increased intracranial pressure occur in a large percentage of these cases.

3. The homolateral hemiparesis and homolateral dilated, or dilated and fixed, pupil may indicate a large, expanding brain lesion, but since these symptoms occur in one half of the cases with unequal pupils they are of no value in locating the lesion.

4. There is no anatomical justification for lumbar puncture in this condition either as a diagnostic or a therapeutic measure; it is dangerous and can furnish no reliable information.

5. The plan of surgical procedure in these cases should be the same as that used in treating tumors of the brain.

6. Ventriculography should be used as often as possible in the localization of the lesions; it is safe and the results are reliable.

7. A large osteoplastic flap should be used to evacuate the clot; if the patient is too ill to submit to a major procedure a subtemporal decompression should be performed. This procedure facilitates the removal of the clot, assists in control of bleeding, aids in removing the greater portion of the cyst wall and leaves a decompression to combat cerebral edema.

8. Recent work has shown the importance of removal of the greater portion of the cyst wall of the hematoma.

9. Drainage of all wounds makes possible complete evacuation of all foreign material from the subdural space and aids in obliteration of the cavity.

10. Some brains fail to expand after the removal of the hematoma. It has been shown that the proper procedure is to force fluids and administer large doses of sodium chloride by mouth until the onset of cerebral edema when fluids should be limited.

11. Two cases of the twenty-four are reported.

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## BIBLIOGRAPHY

1. Abbott, W. D.: Traumatic Subdural Hematoma, *Am. J. Surg.* **33**:32-35 (July) 1936.
2. Alava, P., and Stat, S.: Traumatic Subdural Hemorrhage, *Ann. Surg.* **100**:304-309 (August) 1934. (1 case.)
3. Allen, A. M.; Daly, B. B., and Moore, M.: Subdural Hematoma in Psychotic Patients; A Study of 245 Cases Found Among 3,100 Consecutive Autopsies, *J. Nerv. & Ment. Dis.* **82**:193-196 (August) 1935.
4. Baker, A. B.: Subdural Hematoma, *Arch. Path.* **26**:535-559 (August) 1938.
5. Baker, M. H.: Edema as Influenced by a Low Ratio of Sodium to Potassium Intake, *J. A. M. A.* **98**:2193-2197 (June 18) 1932.
6. Bowen, W. H.: Traumatic Subdural Hemorrhage, *Guy's Hospital. Rep.* **59**:21-154, 1905.
7. Brodie, F.: Delayed Subdural Hemorrhage, *Canad. M. A. J.* **20**:273-277 (March) 1939. (4 cases.)
8. Bullard, W. N.: The Diagnosis of Pachymeningitis Interna Hemorrhagica, *Boston M. & S. J.* **133**:461-463, 1895. (1 case.)
9. Burhans, C. W., and Gerstenberger, H. J.: Internal Hemorrhagic Pachymeningitis in Infancy, *J. A. M. A.* **80**:604-609 (March 3) 1923. (5 cases.)
10. Cant and Brooks: Case of Traumatic Epilepsy; Trephining; Recovery; Remarks, *Lancet* **1**:542, 1891. (1 case.)
11. Carter, B. N.: Extradural Hemorrhage and Chronic Subdural Hematoma, *J. Med.* **13**:305-309 (August) 1932. (1 case.)
12. Coleman, C. C.: Chronic Subdural Hematoma: Diagnosis and Treatment, *Am. J. Surg.* **28**:341-363 (May) 1935. (4 cases.)
13. Connolly, E. A., and Houlton, T. L.: Chronic Subdural Hemorrhage, With Case Report, *Nebraska M. J.* **14**:115-117 (March) 1929. (1 case.)
14. Craig, W. M.: Chronic Subdural Hematoma, *Surg. Clin. N. America* **7**:1523-1529 (December) 1927. (5 cases.)
15. Craig, W. M.: Chronic Subdural Hematoma: A Condition That Follows Everyday Accidents, *Surgery* **1**:761-769 (May) 1937. (6 cases.)
16. Critchley, M., and Meadows, S. P.: Calcified Subdural Hematoma, *Proc. Roy. Soc. Med.* **26**:306-308 (January) 1933. (1 case.)
17. D'Errico, A. P., and German, W. J.: Chronic Subdural Hematoma, *Yale J. Biol. & Med.* **3**:11-20 (October) 1930. (2 cases.)
18. Dickerson, D. G.: Intracranial Hemorrhage, *Northwest Med.* **28**:535-543 (December) 1939. (1 case.)
19. Dickerson, D. G.: Delayed Traumatic Subdural Bleeding, *Southwestern Med.* **16**:279-286 (July) 1932.
20. Doughty, R. G.: Post-traumatic Delayed Intracerebral Hemorrhage, *South. M. J.* **31**:254-256 (March) 1938. (2 cases.)
21. Dyke, C. G.: A Pathognomonic Encephalographic Sign of Subdural Hematoma, *Bull. Neurol. Inst. New York* **5**:135-140 (August) 1936. (1 case.)
22. Elvidge, A. R.: Head Injuries, *Canad. M. A. J.* **38**:26-33 (January) 1938. (1 case.)
23. Fitch, T. S. P.: Epidural and Subdural Hemorrhages, *Lancet* **57**:357-362 (August) 1937. (2 cases.)
24. Fleming, H. W., and Jones, O. W.: Chronic Subdural Hematoma, Simple Drainage as a Method of Treatment. Report of 8 Cases, *Surg. Gynec. & Obst.* **54**:81-87 (January) 1932. (8 cases.)
25. Flothow, P. G.: Chronic Traumatic Subdural Hematoma, *West. J. Surg.* **15**:657-662 (December) 1937. (2 cases.)
26. Frazier, C. H.: The Surgical Management of Chronic Subdural Hematoma, *Ann. Surg.* **101**:671-689 (February) 1935. (6 cases.)
27. Furlow, L. T.: Chronic Subdural Hematoma, *Arch. Surg.* **32**:688-708 (April) 1936. (16 cases.)
28. Gardner, W. J.: Traumatic Subdural Hematoma, *Arch. Neurol. & Psychiat.* **27**:847-858 (April) 1932. (1 case.)
29. Gilman, B. B., and Tanzer, R. C.: Subdural Hematoma in Infantile Scurvy, *J. A. M. A.* **99**:989-991 (September 17) 1932. (1 case.)
30. Gordon, A.: Internal Pachymeningitis in Young Children, *New York M. J.* **99**:720-723, 1914. (1 case.)
31. Grant, F. C.: Chronic Subdural Hematoma, *Ann. Surg.* **86**:485-493 (October) 1927. (3 cases.)
32. Grant, F. C.: Chronic Subdural Hematoma, *J. A. M. A.* **105**:845-849 (September 14) 1935.
33. Griswold, R. A., and Jelsma, F.: The Relationship of Chronic Subdural Hematoma and Pachymeningitis Hemorrhagica Interna, *Arch. Surg.* **15**:45-56 (July) 1927. (4 cases.)
34. Gross, S. W., and O'Kane, T. J.: Traumatic Subdural Hematoma, *New York State J. Med.* **38**:117-121 (January 15) 1938. (5 cases.)
35. Hall, G. S.: The Diagnosis of Chronic Subdural Hematoma of Traumatic Origin, *J. Neurol. & Psychopath.* **17**:262-269 (January) 1937. (4 cases.)
36. Hammes, E. M.: Delayed Traumatic Intracranial Hemorrhage, *Minnesota Med.* **12**:86-90 (February) 1929. (3 cases.)
37. Hannah, J. A.: The Aetiology of Subdural Hematoma, *J. Nerv. & Ment. Dis.* **84**:169-186 (August) 1936.
38. Heuer, G. J., and Dandy, W. E.: A Report of Seventy Cases of Brain Tumor, *Bull. Johns Hopkins Hosp.* **27**:224 (August) 1916.
39. Hoehn, T. L., and Panet-Raymond, J.: Contribution a L'Etude Des Hematomes Sous Duraux Post Traumatiques, *L'Union Medicale du Canada, Montreal* **65**:430-437 (May) 1936. (3 cases.)
40. Holman, E., and Scott, W. M. J.: Significance of Unilateral Dilatation and Fixation of Pupil in Severe Skull Injuries, *J. A. M. A.* **84**:1329-1332 (May 2) 1925.
41. Holmes, W. H.: Chronic Subdural Hemorrhage, *Arch. Neurol. & Psychiat.* **20**:162-170 (July) 1928. (2 cases.)
42. Holt, W. L., Jr., and Pearson, G. B.: Chronic Bilateral Subdural Hematoma; Encephalographic Diagnosis, With Report of Three Cases, *Arch. Neurol. & Psychiat.* **37**:1161-1167 (May) 1937. (3 cases.)
43. Horrax, G., and Poppen, J. L.: The Recognition and Treatment of Chronic Subdural Hematoma, *Surg. Clin. N. America* **15**:1489-1499 (December) 1935.
44. Horrax, G., and Poppen, J. L.: The Frequency, Recognition and Treatment of Chronic Subdural Hematomas, *New England J. Med.* **216**:381-385 (March 4) 1937.
45. Hulke: Middlesex Hospital, A Case, *Lancet* **2**:814, 1883. (1 case.)
46. Hunt, F. C.: Internal Hemorrhagic Pachymeningitis in Young Children, *Am. J. Dis. Child.* **39**:84-90 (January) 1930. (6 cases.)
47. Jaeger, J. R.: Pachymeningitis Hemorrhagica Interna, *Colorado Med.* **27**:343-346 (September) 1930. (1 case.)
48. Jelsma, F.: Chronic Subdural Hematoma, *Arch. Surg.* **21**:128-144 (July) 1930. (1 case.)
49. Kaplan, A.: Chronic Subdural Hematoma; A Study of Eight Cases With Special Reference to the State of the Pupil, *Brain* **54**:430-459, 1931. (2 cases.)



## HORSESHOE KIDNEY

CAUSING DYSTOCIA AND REQUIRING CESAREAN SECTION

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ST. LOUIS

## CASE REPORT

Mrs. G. H., white woman, aged 19, came to my office March 9, 1938. She had last menstruated January 22, 1938, and had been having slight nausea and vomiting. Her temperature was 98.6 F, pulse 60, respiration 20, blood pressure 120/80, urine normal macroscopically and microscopically.

The uterus was about the size of a two or three months' pregnancy with a slight tendency toward retroversion on pelvic examination. A large mass extended down into the cul-de-sac. It was more prominent on the right side but could be felt on the left side at a slightly higher level, was semisolid and apparently fixed in position. It was explained to the patient that this mass was present and might or might not interfere with delivery and that it might make a cesarean section necessary. She was seen every three weeks. The uterus increased in size in a normal manner but the head of the fetus did not enter the pelvic inlet at any time. Her urine remained normal.

The patient was admitted to the hospital on October 27, 1938, having gained thirty-one pounds, her appetite good, no history of constipation or urinary symptoms with the exception of occasional nocturia. She had had slight hypertension once but her blood pressure on the day of admission was 118/68. Examination showed her heart and lungs normal. Abdominal examination showed the breech high under the subcostal margin, the back on the right, the head not engaged but ballotable above the inlet. The pelvic measurements were: interspinal 22 cm., intercristal 26 cm., intertuberal 8 cm., external conjugate 21 cm., bitrochanteric 30 cm., McDonald measurement 38½ cm.

The patient was having irregular uterine contractions at the time of admission to the hospital. The mass was still present, somewhat oval in shape and apparently fixed in position, posterior to the cervix and displacing the cervix upward and anterior in the pelvis. There was about 1½ cm. dilatation of the cervix and the head was floating above the inlet. Dr. W. H. Vogt was called in consultation six hours after the patient was admitted as little progress had been made. Dr. Vogt's diagnosis was a possible fibroid uteri or an ovarian cyst and he recommended a test of labor to determine if the pelvic mass would be displaced to permit the head to enter the pelvis. Several hours elapsed during which the patient had fairly good uterine contractions every three to five minutes and the head was still floating. It was then decided that she could not have a normal delivery and preparations for cesarean section were made. Gas induction and ether were used. A low cervical cesarian section was performed and a living female baby was delivered through the uterine wound by means of an obstetrical forceps without difficulty. Following closure of the uterine wound, exploration revealed a retroperitoneal tumor mass deep in the pelvis, posterior to the uterus and anterior to the concavity of the sacrum. An incision was made in the posterior parietal peritoneum and this mass was found to have the appearance and consistency of kidney tissue. Further investigation disclosed a horseshoe kidney fused at the upper poles with the concavity pointing downward and with a definite ureter extending down toward the bladder on the left side. The right side of this mass, which was deeper in the pelvis, was not disturbed. It was decided that further exploration was contraindicated and that complete urographic examination should be made at a subse-

50. Kaplan, A.: Subdural Hematoma; Acute and Chronic. With Some Remarks About Treatment, *J. Nerv. & Ment. Dis.* **87**:620-624 (May) 1938.
51. Keegan, J. J.: Chronic Subdural Hematoma, *Arch. Surg.* **7**:629-644 (October) 1933. (5 cases.)
52. Kennedy, F., and Wortis, H.: "Acute" Subdural Hematoma and Acute Epidural Hemorrhage, *Surg. Gynec. & Obst.* **63**:732-742 (December) 1936.
53. Kernohan, J. W., and Woltman, H. W.: Incisura of the Crus Due to Contralateral Brain Tumor, *Arch. Neurol. & Psychiat.* **21**:274-287 (February) 1929.
54. King, C.: Chronic Traumatic Subdural Hematoma as a Cause of Choked Disc, *Am. J. Ophth.* **20**:149-153 (February) 1937. (1 case.)
55. Lindemulder, F. G.: Subdural Hematoma Shown by Encephalography, *Am. J. Roentgenol.* **25**:512-514 (April) 1931. (1 case.)
56. Love, J. G., and Bailey, A. A.: Multilocular Chronic Subdural Hematoma, Traumatic in Origin With Negative Neurologic Examination, *Proc. Staff Meet., Mayo Clin.* **12**:600-604 (September 22) 1937. (1 case.)
57. Macewen, W.: Case Illustrative of Cerebral Surgery, *Lancet* **1**:881-883, 1885. (1 case.)
58. Madigan, P. S.: Encephalography in Cerebral Surgery and Report of a Case of Pachymeningitis Interna, With Cyst Formation, Successfully Removed, *Mil. Surgeon* **66**:390-397 (March) 1930. (1 case.)
59. Martin, J. P.: Chronic Subdural Hematoma, *Proc. Roy. Soc. Med.* **24**:585-590 (Jan. 8) 1931.
60. McConnell, A. A.: Subdural Hemorrhage Following a Trivial Accident, *Irish J. M. Sc.* **160**-161 (April) 1930. (1 case.)
61. McKenzie, K. G.: A Surgical and Clinical Study of Nine Cases of Chronic Subdural Hematoma, *Canad. M. A. J.* **26**:534-544 (May) 1932. (11 cases.)
62. Munro, D.: The Diagnosis and Treatment of Subdural Hematoma, *New England J. Med.* **210**:1145-1160 (May 31) 1934. (13 cases.)
63. Munro, D., and Merritt, H. H.: Surgical Pathology of Subdural Hematoma, Based on a Study of One Hundred and Five Cases, *Arch. Neurol. & Psychiat.* **35**:64-78 (January) 1936.
64. Munro, J. C.: Surgical Treatment of Hemorrhagic Pachymeningitis, *Chicago M. Rec.* **23**:281, 1902. (4 cases.)
65. Naffziger, H. C.: Subdural Fluid Accumulations Following Head Injury, *J. A. M. A.* **82**:1751-1752 (May 31) 1924.
66. Naffziger, H. C., and Brown, H. A.: Chronic Subdural Hematoma in Infants, *Surg. Clin. N. America* **14**:1465-1483 (December) 1934. (5 cases.)
67. Nash, C. C.: Chronic Subdural Hematoma, *South. M. J.* **28**:779-785 (September) 1935. (8 cases.)
68. Peet, M. M., and Kahn, E. A.: Subdural Hematoma in Infants, *J. A. M. A.* **98**:1851-1856 (May 28) 1932. (9 cases.)
69. Phillips, G.: The Surgical Sequelae of Acute Cerebral Trauma, *M. J. Australia* **1**:41-45 (January 11) 1936.
70. Putnam, T. J., and Cushing, H.: Chronic Subdural Hematoma, *Arch. Surg.* **11**:329-393 (September) 1925. (12 cases.)
71. Putnam, I. K., and Putnam, T. J.: The Experimental Study of Pachymeningitis Hemorrhagica, *J. Nerv. & Ment. Dis.* **65**:260-272 (March) 1927.
72. Rand, C. W.: The Significance of a Dilated Pupil on the Homolateral Hemiplegic Side in Cases of Intracranial Hemorrhage Following Head Injuries, *Arch. Surg.* **18**:1176-1189 (April) 1929. (7 cases.)
73. Rosenbaum, H. A.: Internal Hemorrhagic Pachymeningitis, *Arch. Pediat.* **46**:56-58 (January) 1929. (1 case.)
74. Rosenthal, R.: Pachymeningitis Hemorrhagica Interna, Report of a Case With Recovery, *Minnesota Med.* **14**:547-550 (June) 1931. (1 case.)
75. Sachs, B., and Elsberg, C. A.: Extensive Subdural Hemorrhage After Trauma, *New York M. J.* **104**:633 (September 30) 1916.
76. Secretan, W. B.: A Case of Chronic Subdural Hematoma, *Roy. Berkshire Hosp. Rep.* **13**-16, 1933. (1 case.)
77. Secretan, W. B.: A Case of Subdural Hematoma, *Roy. Berkshire Hosp. Rep.* **144**-147, 1934-35. (1 case.)
78. Sherwood, D.: Chronic Subdural Hematoma in Infants, *Am. J. Dis. Child.* **39**:980-1021 (May 30) 1930. (9 cases.)
79. Spiller, W., and McCarthy, D. J.: A Case of Internal Hemorrhagic Pachymeningitis in a Child of Nine Years, With Changes in Nerve Cells, *J. Nerv. Ment. Dis.* **26**:677-696, 1899.
80. Trotter, W.: Chronic Subdural Hemorrhage of Traumatic Origin and Its Relation to Pachymeningitis Hemorrhagica Interna, *Brit. J. Surg.* **2**:271-291, 1914. (4 cases.)
81. von Storch, T. J. C., and Munro, D.: Encephalography in the Diagnosis of Subdural Hematoma, *New England J. Med.* **218**:6-9 (January 6) 1938.
82. Wells, F. L.: An Interesting Case of Subdural Intracranial Hemorrhage (Without Fracture) Leptomenigitis—Trephining—Recovery, *M. Rec.* **41**:541-542, 1892.
83. White, C.: A Patient Who Was Operated on in 1914 for Neonatal Subdural Hemorrhage, *Proc. Roy. Soc. Med.* **23**:189, 1929. (1 case.)
84. Wiglesworth, J.: Remarks on the Pathology of So-called Pachymeningitis Interna Hemorrhagica, *Brain* **15**:431-436, 1892.
85. Woltman, H. W.: Chronic Subdural Hematoma, *Proc. Staff Meet., Mayo Clin.* **2**:154-155 (July 13) 1927. (1 case.)
86. Zollinger, R., and Gross, R. E.: Traumatic Subdural Hematoma, an Explanation of the Late Onset of Pressure Symptoms, *J. A. M. A.* **103**:245-249 (July 28) 1934. (1 case.)



Fig. 1.

quent time. The wound was closed and the patient left the operating room in good condition.

The patient had a persistent elevation of temperature without subjective or objective symptoms for the first seventeen postoperative days. Urinary infection was considered but this was not substantiated until the seventeenth day when the urine was found to be loaded with red and white blood cells. Dr. H. H. Kramolowsky was called for urological consultation. Cystoscopic examination revealed a generalized mild degree of inflammation of the bladder which was more severe around the right ureteral orifice. Catheters were passed with difficulty and for only a short distance on each side. Pus and bacteria were obtained from both pelves of the horseshoe kidney. The radiographic report follows: "Examination of the urinary tract fails to reveal the kidney shadows in their normal positions. Opaque ureteral catheters extending into the ureters are seen to be coiled up on both sides a few inches from the bladder orifices. Injection of opaque material reveals irregular kidney pelves low down in the pelvis, anterior to the lower portion of the sacrum with the calices pointing medially and the kidney pelves on the outer side. This is evidence of a fused horseshoe kidney. There is no evidence of pathology in the bony structure."

On sulfanilamide administration the patient's condition began to improve. Eight days later cystoscopic examination showed a generalized cystitis. Bladder irrigations were instituted. Cystoscopic examination ten days later revealed an improvement in the condition of the bladder although pus and bacteria were still present in the urine. The patient received seven blood transfusions following the operation as she developed an anemia, probably secondary to the cystitis and pyelitis.

The patient left the hospital, walking and her general condition improved, on December 11, 1938. Since that time she has observed a slight cloudiness of her urine at times and urinalysis has shown a few pus cells. Her temperature has remained normal and her blood pressure on January 10, 1939, was 130/80.

A pelvic examination on January 10, 1939, showed the external genitalia normal, the pelvic floor firm and strong and the vagina normal. The large mass in the pelvis, now known to be a horseshoe kidney, was not changed in size, shape or position. The cervix was closed, firm and pointing into the vagina from the upper left quadrant of the pelvis, having been pushed there by the tumor mass. The body of the uterus was of normal size and was pushed to the upper left quadrant of the pelvis, it was firm and freely movable with a slight tendency toward retroversion. The left adnexa was normal to palpation but the right revealed a small mass

which is probably a small retention cyst of the ovary. In general, the patient was free from all symptoms and both she and her baby were doing well.

A voluminous amount of material on horseshoe kidney appears in the literature but reports of horseshoe kidney in the pelvis are, for the most part, rare. Gutierrez<sup>1</sup> described the asymmetrical type of horseshoe kidney which is usually found low in the pelvis and Gerard<sup>2</sup> suggested the classification of horseshoe kidney into two groups: the symmetrical and the asymmetrical. He divides the symmetrical into two types, the most common, in which the organ's isthmus is formed by fusion of the lower poles and the concavity facing upward, and the type in which the fusion is made by union of the upper poles, the concavity facing downward. The second group of his classification is that in which the fusion of the two organs adopts different forms anatomically in the point of union and in which there is a difference in shape, location, position and the point of fusion. The latter is the more rare and Gutierrez says they are seldom seen.

Gutierrez writes that there are descriptions of horseshoe kidney by Berengari de Capri in the year 1552 and that Morgani is given credit for the first anatomical description as well as the physiological observation of its associated pathology. Gutierrez names three eras in which horseshoe kidney have been found, diagnosed and described: (1) In the early days of medicine horseshoe kidneys were found only in postmortem and cadaver dissection. (2) Approximately a half century ago horseshoe kidneys were diagnosed at operations for abdominal tumors of undetermined origin and in a few instances authors mentioned fused, ectopic, unilateral kidney being mistaken for an abdominal tumor and removed with consequent anuria and death. (3) In the era of clinical diagnosis operations for horseshoe kidneys were performed, first

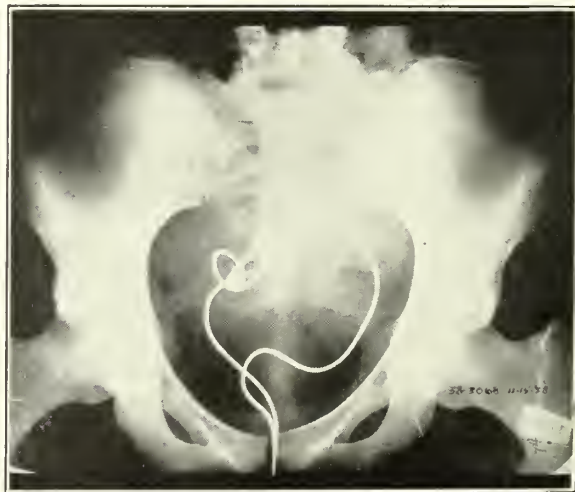


Fig. 2. Mrs. G. H. X-ray picture of pelvis. Opaque ureteral catheters coiled up on both sides in the pelves of the horseshoe kidney lying anterior to the sacrum, a few inches from the urinary bladder orifice. (Before injection with opaque material for X ray picture.)



on diagnosis made purely by physical examination, and later when perfection in urography enabled a more definite diagnosis.

There are a number of cases on record of prolapse of one kidney into the pelvis and many reported cases of pathological horseshoe kidney, but they have been in the normal position for horseshoe kidney, that is, at the level of the third or fourth lumbar vertebra, and did not interfere with delivery. There are a few cases on record of a single kidney prolapse which interfered with delivery.

A search of the "Surgeon General's Index"<sup>1</sup> (from 1903 to date), the "Quarterly Cumulative Index Medicus"<sup>4</sup> (1920 to 1938), "Anomalies and Curiosities of Medicine" by Gould and Pyle,<sup>5</sup> and DeLee's<sup>6</sup> textbook gave no information on horseshoe kidney in the pelvis interfering with delivery. Inquiry at the anatomical department of St. Louis University elicited the information that more than two thousand bodies had been dissected since 1900 and that several cases of horseshoe kidney in the abdominal cavity were found but there is no record of a case of horseshoe kidney deep in the pelvis.

Gutierrez states that Lipshutz and Hoffman tabulated hospital records of various institutions in this country and abroad in a study of 70,502 post-mortem examinations in which 105 horseshoe kidneys were found, estimating a ratio of 1 to 671 examined; Legueu and Papin place the ratio at 1 case in every 500 to 600. Gutierrez says "But since the introduction of urography as a routine method of diagnosis, the frequency with which this type of anomaly is discovered in vivo has considerably increased, and horseshoe kidney is quite commonly found in any active urological service at the present time. Hence the ratio may now be put at about 1 in 100 or 200 pyelographs."

Newell<sup>7</sup> in discussing indications for cesarean section states "Prolapse of normal or enlarged kidney into the pelvis may so obstruct the pelvic cavity that if it is not discovered and removed during pregnancy, cesarean section will prove necessary for delivery, a small number of such cases being reported in the literature. One case has been reported in which a prolapsed spleen was removed from the pelvis in the second month of pregnancy, thus suggesting that in rare instances, a prolapsed spleen, which is not discovered during pregnancy, may prove a serious obstruction to labor and necessitate cesarean section."

Davis<sup>8</sup> states "It must also be remembered that tumors which complicate pregnancy may be found in the pelvis but not connected with the genital organs. A prolapsed kidney, a greatly distended and enlarged appendix, prolapsed spleen, and ectopic pregnancy may complicate gestation. While in some of these cases diagnosis may be difficult, treatment fortunately is the same; abdominal incision, accurate diagnosis concerning the nature of the tumor and such treatment as is appropriate to the condition present."

**Embryology.**—The horseshoe kidney is formed in the early weeks of uterine life. After the cell divi-

sion into mesoderm and endoderm, there are derived from this tissue three embryological organs: pronephros, mesanephros and metanephros, from the last of which the permanent kidney is ultimately evolved. During the formation of the wolffian duct, two renal buds are placed in back of it, even before the cloaca separates into the rectal and urogenital sinus. This early approximation of the renal buds may account for the later development of the congenital malformed kidney.

**Anatomy.**—The horseshoe kidney is usually a continuous mass of renal parenchyma, the concavity either facing upward or downward according to the type, and the calices and ureters usually coming from the ventromedian side. There are, however, all sorts of variations, and the literature reports cases of horseshoe kidneys with two pelves and four pelves, and with two, four or five ureters leaving the pelves to connect with the bladder. The blood supply is usually from the arteries, from the abdominal aorta or from the iliacs, but there are many variations in this as well as in the number of anomalous vessels. The nerve supply is from the sympathetics, the parasympathetics, the solar plexus and the splanchnic nerve. The lymphatic circulation is from a network of lymphatic ganglia in the cellular retroperitoneal space and branches of the lymphatics that follow the renal pedicle and the great abdominal vessels.

The horseshoe kidney is subject to all of the diseases and pathological conditions which affect the normal kidney. Moreover, due to its usual anatomical immobility and pressure from the large vessels and other organs, and due to the fact that its isthmus is usually in contact with abdominal organs, the horseshoe kidney suffers from stasis, interference with blood supply and constant irritation. As a result, the resistance of the kidney is lowered thereby making it more susceptible to pathological conditions than the normal kidney.

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#### BIBLIOGRAPHY

1. Gutierrez, R.: Clinical Management of Horseshoe Kidney, *Am. J. Surg.* (December) 1931; (January) 1932, (February) 1932.
2. Gerard: Classification of Horseshoe Kidney.
3. Surgeon General's Index.
4. Quarterly Cumulative Index, Chicago, American Medical Association.
5. Gould and Pyle: *Anomalies and Curiosities of Medicine*, 1897.
6. DeLee, Joseph: *Practice of Obstetrics*, ed. 4.
7. Newell, Q. U.: *Gynecological and Obstetrical Monograph*, New York, D. Appleton & Co., 1921.
8. Davis: *Complications of Pregnancy*, Chap. 4, p. 29.
9. Keyes, Edward L., Jr.: *Urology*, New York, D. Appleton & Co., 1920.

Syphilis was transmitted to five of eleven members of a family by means of kissing, Gracie R. Rowntree, M.D., and James Robert Hendon, M.D., Louisville, Ky., report in *The Journal of the American Medical Association* for July 13. The original familial infection was from an outside source—through kissing.

The authors state that physicians should be more suspicious of all lesions which might possibly be syphilitic. Two of their patients, they say, had previously been to physicians who made a diagnosis of lip impetigo in one and trench mouth in the other.

## TREATMENT OF PERTROCHANTERIC FRACTURE OF THE FEMUR WITH A LAG BOLT

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Conservative treatment of trochanteric fractures of the femur by traction, casts or well-leg counter-traction has been universally advocated as union almost invariably occurs, provided the patient survives. We believe that the management of these cases is more difficult than is implied by the literature and textbooks which would have one believe that the mortality is about 15 per cent,<sup>1,2</sup> some reporting a lower mortality than in intracapsular fractures.<sup>3</sup>

This has not been our experience and it seems that the mortality is much higher than is realized. In a series of 302 cases over a period of the last six years at the St. Louis City Hospital the mortality was 39.3 per cent and a survey of seven of the larger private hospitals of this city reveal that the mortality in 335 cases was 26 per cent. (Table 1.)

Table 1. Mortality in 335 Cases

Hospital	Number of Cases	Average Age	Mortality	Average Age Cases Expired	Average Number Hospital Days
St. Louis City Hospital	302	68.1	39.3	74.0	84.7
7 Private St. Louis Hospitals	335	72.2	26.0	75.2	56.4
Total	637	70.5	32.1	74.3	74.4

The higher mortality in the City Hospital probably is due in part to the type of patients whose poor physical condition is brought about by their lower standard of living, and also due to the fact that they are observed in the hospital longer than are private cases who usually are discharged long before the fracture has united and thus the mortality of patients treated in private hospitals is probably higher than the hospital records indicate.

Table 2. Causes of Death

	7 Private St. Louis Hospitals Per Cent	St. Louis City Hospital Per Cent
Pneumonia	53.4	39.0
Cardiac failure	20.0	14.0
Traumatic shock	5.8	11.0
Cerebral accident	4.6	
Pulmonary embolus	2.3	9.0
Chronic nephritis	2.3	19.0
Miscellaneous	11.6	8.0
Expired during the first week after injury	29.0	38.0

It is known that the old adage, "treat the patient and let the fracture alone," is not true and that to

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treat the patient one must treat the fracture. From these mortality figures it would seem that the trend has swung too far the other way and fractures have been treated instead of patients.

These fractures usually occur in elderly individuals whose average age is about 70 years. If they do withstand the initial shock of the injury they apparently do not tolerate well the treatment of the fracture which to be adequate ordinarily requires prolonged immobilization in bed. This reduced activity abruptly changes the patient's whole mode of life. The appetite, bowel habits and metabolic processes are disarranged by this supine existence which also favors pulmonary congestion, the forerunner of bronchopneumonia, and thus their low resistance is lessened still more, often ensuing in death.

Most of the patients at the City Hospital were treated in a Hodgen splint which allows some freedom but keeps the patient on his back and has the disadvantage of necessary frequent adjustments in order to maintain the proper lines of traction. Skeletal traction on the distal end of the femur has the same disadvantages. Body spica casts make nursing care more difficult and the patient must lie flat in bed and even if he is turned from side to side he still remains in a horizontal position. An ambulatory spica cast has remedied this disadvantage to some extent but it can be applied only on selected cases who are unusually vigorous.<sup>4</sup> The well-leg traction splint, more recently improved by well-thigh traction, has been a decided benefit in allowing more freedom and enabling the patient to sit up in a wheel chair.<sup>5</sup> However, it has the disadvantage of immobilizing the well extremity and some stiffness and pain in both knees is not infrequent during convalescence and delays the return of normal function. (Table 3.)

Table 3. Methods of Treatment

Methods Used in Treatment in 7 Private St. Louis Hospitals	Number Cases	Number Expired	Mortality Per Cent
Hodgen splint and traction	190	49	25.8
Plaster spica casts	105	26	24.7
Well leg or well-thigh traction	20	4	20.0
Sand bag immobilization (used mostly in critical cases)	17	7	41.1
Three flanged nail (Smith-Petersen)	3	0	0.0

Since such excellent results have been obtained by insertion of the Smith-Petersen nail in fractures of the neck of the femur at the St. Louis City Hospital<sup>6</sup> and since similar results are being reported universally it was thought that trochanteric fractures also could be treated with this form of internal fixation in an effort to decrease the mortality. These patients could be offered more normal activity, a shorter period of hospitalization and important physical therapy measures could be applied.<sup>7</sup> There would be an earlier return to function with-



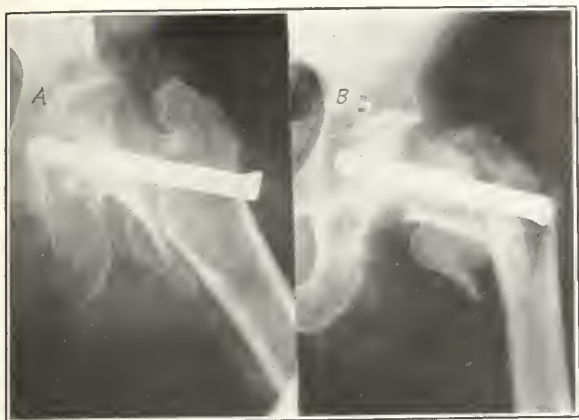


Fig. 1. (a) Accurate reduction and nailing of a trochanteric fracture following operation. (b) Same case following day showing inadequate fixation by the Smith-Petersen nail, due to comminution of cortex of the femur by the nail.

out the usual stiffness and pain in their lower extremities.

A series of trochanteric fractures were treated thus with the three-flanged nail by the resident staff of the St. Louis City Hospital. An analytical survey of these cases has not been made but it seems to the staff that the nail does not offer adequate immobilization of the fracture. The proximal end of the distal fragment of the femur usually has a thin shell of bone that is easily shattered when the nail is hammered in and immobilization of the fragments is not obtained (fig. 1). Nearly every case has shown variable degrees of coxa vara and shortening, so marked in some cases that the angle of the neck and shaft is less than 90 degrees (fig. 2). The staff believes the end results of this series, in regard to bone lesion, cannot be considered satisfactory but most of the patients so treated were definitely more comfortable and allowed more activity.

Considerable success has been demonstrated in a number of cases by Dr. J. A. Key who recommends internal fixation of trochanteric fractures with the Smith-Petersen nail, but he uses a special technic in inserting the nail and in the after-care as the fixation obtained by the nail in trochanteric fractures is not as secure as in intracapsular fractures.

If one is to prevent the coxa vara and shortening by applying traction on the extremity after the operation, we think the primary purpose of the operation is defeated as the mobility of the patient is about the same as when treated in a Hodgen splint. Similarly if a cast is applied postoperatively, the surgical procedure would be superfluous.

The mechanics of immobilization by internal fixation of a trochanteric fracture and a fracture through the neck of the femur are entirely different. There is considerably less shearing strain on a properly inserted Smith-Petersen nail in a fracture through the neck of the femur than in a nailed trochanteric fracture. As long as the nail holds the fragments of a fracture through the neck of the

femur firmly in position, any force directed upward on the shaft usually tends to impact the fragments together. Furthermore the proximal fragment moves freely with the shaft as it is not restricted by capsular attachments nor are any muscle actions directed on it.

These facts do not apply to a nailed trochanteric fracture. A force directed upward on the shaft tends to separate the fragments. Since movements of the proximal fragments are restricted by capsular attachments and powerful muscles abduct it laterally, any adduction of the extremity would separate the upper part of the fractured surface and thus pry the nail out. This is apparently what happens as follow-up roentgen ray films indicate.

For these reasons it was thought that a lag bolt similar to the type advocated by Melvin Henderson in the treatment of fractures of the neck of the femur<sup>9</sup> might solve the problem of the adduction's prying out the nail, and if we did not allow any force to be directed upward on the shaft by weight bearing the bolt would immobilize the fragments so that no external fixation would be necessary. The insertion would be done by drilling instead of hammering and comminution of the outer cortex would be much less likely to occur.<sup>10</sup>

We devised a lag bolt which is similar to the lag screw of Henderson. Although the bolt is the same in principle we feel that it is simpler and requires only one special instrument for the procedure (fig. 3).

The lag bolt in  $4\frac{3}{4}$  inches long and the outer end is threaded twenty-four to the inch for 2 inches and is  $\frac{7}{32}$  inch in diameter. There are five spiral-buttress lags to the inch on the inner end for  $1\frac{1}{2}$  inches and they protrude  $\frac{1}{8}$  inch so the whole diameter is  $\frac{7}{16}$  inch. The groove in which the washer-catch



Fig. 2. Coxa vara and shortening of the usual degree seen in the end result of a trochanteric fracture treated by internal fixation with the Smith-Petersen nail.

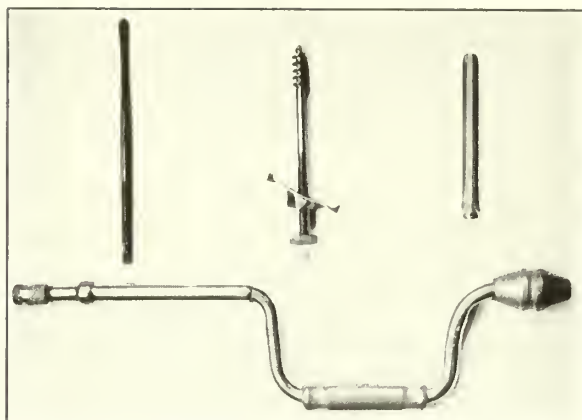


Fig. 3. The instrument used to insert the drill (A) and the lag bolt (B). The  $\frac{3}{4}$  inch Smith-Petersen nail (C) is shown to compare with the size of the bolt. There is a slot in the end of both the drill and the lag bolt into which a key of the brace fits and is held tightly by a turn of the end of the brace. The washer of lag bolt, assembled (B), also has a catch which fits into the slot of the lag bolt preventing rotation of the washer on the lag bolt and the prongs of the washer, which are imbedded in the cortex of the femur, in turn prevent rotation of the washer. Thus firm fixation of the fragments is achieved.

and the brace-key fit is 2 inches long and  $\frac{1}{16}$  inch deep and  $\frac{1}{16}$  inch wide. A  $\frac{5}{8}$  inch hexagonal nut screws on the outer end. The washer is wedge shape and soldered on to a plate 2 inches long and  $\frac{1}{2}$  inch wide, the four corners of which are made into the prongs  $\frac{1}{8}$  inch long. The angle made by the bolt and the wedge-shaped washer is 130 degrees.

The lag bolt is  $4\frac{3}{4}$  inches long because it should be placed low down on the shaft as far as possible from the fracture site to avoid comminution and to decrease shearing stress as there is still considerable force exerted on the proximal fragment by the abductor muscles even if weight bearing is not allowed. There is more displacement of bone by the lag bolt than by the Smith-Petersen nail but the surface area of the lag bolt is not as much as that of a  $\frac{3}{4}$  inch Smith-Petersen nail of the White-Johansen type (fig. 3).<sup>\*</sup> It is the amount of metal in contact with the bone rather than the size of the foreign body that is the cause of undesirable effects on this account and furthermore bone necrosis adjacent to the nail usually is not seen by roentgenogram until the third or fourth month, and union in a trochanteric fracture will usually have occurred before this, about the tenth week. The "lags" of the bolt do not extend over  $1\frac{1}{2}$  inches of the bolt as the upper end of the femur, including a lower part of the neck, for practical purposes can be compared to a hollow tube. The marrow cavity with the little cancellous bone present could not assist in holding the "lags" of the bolt. The only place the bolt is fixed is in the head and at the cortex of the femoral shaft below the greater trochanter.

It should be noted that subtrochanteric fractures

<sup>\*</sup>This area was calculated by Prof. A. L. Hughes of the Physics Department of Washington University, St. Louis, and the area of the lag bolt was found to be 31.06 sq. cm. and that of the Smith-Petersen nail was 38.7 sq. cm.

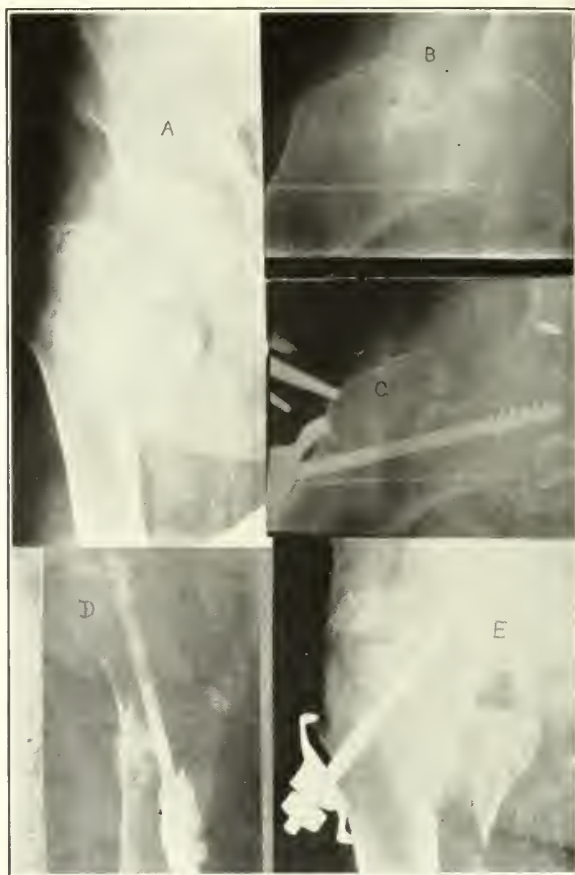


Fig. 4. Patient, aged 82, with pronounced arteriosclerosis and cystitis made good convalescence; up in wheel chair daily, without external fixation and walked with aid of a cane only after four months. (A) Recent trochanteric fracture. (B) Reduced fracture showing needle threaded in the skin over the neck of the femur slightly low. (C) Lag bolt inserted allowing for correction of low placed needle. (D) Lateral view at operation. (E) Same case three months later, no coxa vara or shortening present.

are not included in these statistics as they rightly belong with fractures of the shaft and they are not amenable to this type of operative fixation. One would not expect this method to decrease the mortality in those cases which expired in the first week and comprised one third of all the deaths, but it would seem that the mortality could be greatly reduced in the remaining two thirds as most of the deaths occurred in the second to fourth weeks. This form of treatment can be offered only for the true pertrochanteric fractures and should not be attempted in the presence of much comminution of the fragments. Old age and general debility are not a contraindication as patients of this type would be particularly benefited by the postoperative freedom offered by this method of treatment. We have found that the operation can be done under local anesthetic with little pain and without shock to the patient.

The patient is prepared with morphine gr.  $\frac{1}{6}$  and hyoscine gr.  $\frac{1}{200}$  one hour before removing him to the fracture table and the fracture site is infiltrated with novocain 1 per cent. (In many cases morphine



is omitted.) The fracture is reduced by traction and abduction. The distance between the anterosuperior spine and the internal malleolus on each side is compared and determines the amount of traction necessary. Both extremities are fixed to the foot brackets of the table. Fixation of both extremities prevents rotation of the pelvis and reduction is maintained with more certainty. A spinal puncture needle is threaded through the skin approximately in the direction of the axis of the neck of the femur and an anteroposterior roentgen ray film is made. If the reduction is satisfactory a 2 inch incision is made  $1\frac{1}{4}$  inches below the greater trochanter. A knowledge of the various angles that the neck makes with the shaft together with the position of the spinal needle as shown on the roentgen ray film is sufficient to start a  $\frac{7}{32}$  inch drill in the correct direction. The drill is inserted one inch, and an anteroposterior and lateral roentgen ray film is taken. If the position is faulty the direction can be changed without removing it as the cortex of the femur acts as a fulcrum and the marrow cavity does not obstruct the end. If the position is correct the drill is inserted well into the head of the femur and removed. The lag bolt is fitted in the brace and is easily screwed into the drill hole. The wedge-shaped washer is applied with the thicker part on the upper side and the prongs of the washer are gently tamped into the cortex. The washer serves two purposes, preventing rotation of the bolt and diffusing the pressure of the nut over a larger area of the cortex of the shaft. The nut is tightened with a socket wrench and the wound is closed with silk (fig. 4).

We have not adopted any postoperative routine and feel that each case should be given individual care. The amount of activity allowed depends on how firm the fragments are secured at operation. Often the patient may be allowed in a wheel chair the next day, but in some cases it is advisable to keep them in bed for two or three weeks, allowing them to sit up and changing their position frequently. Since we noticed in our series of fractures of the neck of the femur that a variable amount of bone necrosis takes place adjacent to the nail we feel that the lag bolt should be removed after six months at which time union should be solid.

A more extensive series of cases and a larger experience will decide in the future how much internal fixation will aid in reducing the high mortality in trochanteric fractures of the femur, but at present there is no question but that patients are more comfortable and a return of joint function is accomplished much earlier.

#### CONCLUSIONS

1. The management of patients with trochanteric fractures is a difficult problem from the standpoint of sustaining life rather than securing union of the fracture.
2. Fractures about the hip should have an accu-

rate anatomical classification and each type calls for a specific form of treatment.

3. Patients with either type of hip fracture apparently do better if removed from a supine convalescence which we think is an important factor in the high mortality.

4. Internal fixation of trochanteric fractures with the Smith-Petersen nail is difficult technically and the fragments are not held in position as securely as nailed fracture through the neck of the femur.

5. Internal fixation with the lag bolt is a method of treatment which we have found satisfactory in pertrochanteric fractures of the femur as it enables such patients of advanced years and doubtful general condition to be treated without the debilitating experience of external fixation.

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#### BIBLIOGRAPHY

1. Key and Conwell: Management of Fractures, Dislocations and Sprains, St. Louis: C. V. Mosby Co., 1934.
2. Speed, Kellogg: Fractures and Dislocations, Philadelphia: Lea & Febiger, 1935.
3. Christopher: Textbook of Surgery, Philadelphia: W. B. Saunders Co., 1936.
4. Leydig, Stanley M.: New Type of Ambulatory Cast for Treatment of Trochanteric Fractures, J. Missouri M. A. **36**:413 (October) 1939.
5. Anderson, Roger: Numerous publications in last nine years.
6. Leydig, Stanley M.: Fractures of the Neck of the Femur, Surg. Gynec. & Obst. **68**:713 (March) 1939.
7. Brookes, Theodore P., and Ewerhardt, Frank H.: Fractured Hips in the Aged; Improved Prognosis Through Physical Therapy, Arch. Phys. Therapy **20**:29 (January) 1939.
8. Key, J. Albert: Internal Fixation of Trochanteric Fractures of the Femur, Surg. **6**:13 (July) 1939.
9. Henderson, Melvin: Internal Fixation of Fractures of the Neck of the Femur, Arch. Surg. **35**:419 (September) 1937.
10. Bartels, William P.: Treatment of Trochanteric Fractures, J. Bone & Joint Surg. **21**:773 (July) 1939.

For their cooperation and interest in compiling these statistics, we are grateful to Dr. J. Albert Key for the records of Barnes and Jewish hospitals; to Dr. C. A. Stone for those of DePaul Hospital; to the staff authorities of Deaconess and St. John's hospitals; to Dr. O. B. Zeinert for those of the Missouri Pacific Hospital; to Rev. Hofius, director, for those of the Lutheran Hospital. We wish to thank Dr. Henry Thym for his laborious study of many records.

#### KIDNEY EDEMA BENEFITED BY ACACIA

A treatment method which brought about early recovery in 90 per cent of patients suffering with edema (swelling of body tissues due to retention of fluids therein) as the result of dysfunction of the kidneys is described in *The Journal of the American Medical Association* for June 29 by Arnoldus Goudsmit, Jr., M.D., Philadelphia, and Melvin W. Binger, M.D., Rochester, Minn.

The treatment, which the authors say should be carried out in a hospital because close supervision is necessary, involves rest in bed until recovery is well under way, the use of a salt-free diet with a high protein content, a strict limitation of fluids, the administration by mouth of potassium nitrate in pill form and injections into a vein of acacia, a dry, gum-like substance, also called gum arabic, obtained from the Acacia tree.

"When a patient is thus treated," the two physicians say, "the edema will soon disappear. Rarely are additional measures necessary.

"Not so very long ago it was necessary for such patients to be hospitalized for many months before elimination of excessive fluids was accomplished, if it ever was accomplished at all. Such protracted invalidism is comparatively rare at the present time."

## STAPHYLOCOCCUS AUREUS SEPTICEMIA TREATED WITH SULFAMETHYLTHIAZOL

REPORT OF TWO CASES

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The high mortality in staphylococcus septicemia which reflects inadequate and uncertain methods of treatment prompted this report. Before the Southern Medical Association meeting on November 23, 1939, Dr. Grayson Carroll,\* St. Louis, gave the first report on the use of sulfamethylthiazol, a drug thought to be specific in staphylococcus infections. He discussed its successful administration in two cases of *Staphylococcus aureus* septicemia and in cases of perinephritic abscess and pylonephritis caused by this organism.

Two cases of *Staphylococcus aureus* septicemia were successfully treated within the last few months at the St. Louis County Hospital with sulfamethylthiazol, obtained from the Winthrop Chemical Company through Dr. Garyson Carroll. The results have been gratifying.

### REPORT OF CASES

The first case, from the medical service, was D. A., aged 47, white male, who entered the hospital at 9 p. m. December 30, 1939, stating that for the last three months he had been losing weight and had had eleven furuncles on the forearms. For nine days before admission he had had chills and fever with progressive dyspnea and an unproductive cough.

Physical examination revealed an extremely toxic but fairly well developed, well nourished white male, with an elevated temperature and a rather cloudy sensorium. A large abscess 6 by 3 cm. was present over the lateral aspect of the left elbow which was almost fluctuant. A diffuse but slight swelling was present over the upper part of the left anterior chest wall, roughly conforming to the pectoralis major muscle. This was not fluctuant or tender. Roentgen ray examination of the chest failed to reveal pulmonary symptoms. The swelling over the upper left chest did not appear on the roentgenogram.

The furuncle was incised on January 2, 1940. Additional nonfluctuant swellings appeared over the xiphoid process and in the chest wall on the right side and the large area over the upper left chest increased in size, became tender and gave signs of pointing in several areas along the lateral border of the muscle. On January 3 culture of the pus from the abscess showed nonhemolytic *Staphylococcus aureus*. Sulfanilamide grains 120 per twenty-four hours was started.

On January 6 the first blood culture was reported positive for nonhemolytic *Staphylococcus aureus*. On January 8 the abscesses over the xiphoid process and under the left pectoralis major muscle were evacuated. Culture of the pus showed nonhemolytic *Staphylococcus aureus*. Roentgenogram of the chest at that time showed an opacity involving the upper third of the left lung and another opacity in the base of the right lung near the periphery.

Sulfanilamide was discontinued on January 9 and a rabbit antiserum, specific for *Staphylococcus aureus*, was given intravenously in 10 cc. doses beginning on that day and continuing until January 18.

Another abscess on the right chest wall was evacuated

on January 11. The consolidation in the left upper lobe had shown some evidence of resolution by January 13, but on January 15 the right testicle became diffusely indurated and was enlarged about three times normal size and on January 16 the patient became definitely disoriented and developed an increased muscle tonus over the entire body. The following day he developed pain in the left hip but roentgen ray examination on January 18 failed to show evidence of any pathological condition in the hip joint.

On the same day sulfamethylthiazol was started and given in sufficient doses to keep the blood concentration at about 5 mg. per cent. Two additional abscesses developed deep in the left pectoral muscles and were drained on January 20. Shortly after beginning sulfamethylthiazol, the blood became sterile and remained so with the exception of one positive culture; however, the temperature continued elevated, patient looked toxic and the muscles were spastic. No new visible abscesses formed and on February 3 a chest plate showed complete resolution of the consolidation in the left upper lobe and slight resolution in the area of consolidation in the right base.

Temperature gradually became lower and on February 8 sulfamethylthiazol was discontinued. Clinical course was favorable but on February 16 the patient had a temperature of 103 F. and was put back on sulfamethylthiazol. A roentgenogram of the chest on February 17 showed partial resolution of the consolidation in the right base but a new area of density was seen in the lower, outer portion of the right upper lobe. Several days after return to chemotherapy the temperature was within normal limits and has remained so although the drug was discontinued on March 4. On February 28 another examination of the chest showed complete resolution of the consolidated areas in the right lung, however, rarefaction was seen in the centers of these areas and probably represented necrosis.

His general condition now is entirely satisfactory, considering the severity of the disease, without specific therapy and as soon as he regains his former strength he will be ready for discharge.

The second case, treated on the combined orthopedic and medical services, was W. A., aged 24, white male, who was admitted to the hospital on January 18, 1940, with unbearable pain in the left leg of one week's duration.

Patient had osteomyelitis of the left leg twelve years previously and concomitantly developed similar processes in the left forearm and left shoulder. The wounds of the latter two drainage sites healed but a flare-up occurred in the left leg two years later requiring incision and drainage. Since that time drainage from the left leg has continued.

Examination revealed a fairly well developed and well nourished adult white male with an area 4.5 by 7 cm. just above an old scar on the anterior and medial portion of the left leg which was reddened, raised, indurated and exquisitely tender. The scar beneath it was draining a small amount of seropurulent material. Temperature was 102.8 F.

Treatment was symptomatic until January 20 when an incision was made in the area of induration with the release of a large amount of pus. The temperature remained elevated. The wound continued to drain excessively with areas of necrosis widening the incision.

On January 24 an indurated, hot area developed above the wound extending to the knee. The knee joint appeared swollen and fluctuant; 70 cc. of a turbid, amber fluid was aspirated which, on culture, produced nonhemolytic *Staphylococcus aureus* in large quantities. Another aspiration the following day produced 80 cc. of a more purulent material. The patient continued to run high temperatures.

The wound was probed on January 29 and two

\*Carroll, Kappel, et al.: Sulfamethylthiazol, South. M. J. 33: 83 (January) 1940.



pockets of purulent material were released. An incision was made over the area for more adequate drainage. Feeling that drainage was still inadequate, the patient was taken to the operating room again on January 30 where medial and lateral incisions were made in the knee joint with release of a large amount of purulent fluid. Another incision was made in the leg below the

original wound for dependent drainage and another in the popliteal space.

The temperature assumed a septic course after a temporary fall. Blood cultures on January 29 and January 30 were reported positive for nonhemolytic *Staphylococcus aureus*. Eight cc. of staphylococcus antiserum were given intravenously on February 1 but

Table 1. Case 1

Date	Temperature High	Low	Blood Culture	Therapy	Mg. Per Cent Sulfamethyl- thiazol in Blood	RBC in Millions	Blood Picture HB in Grams	WBC	E	B	Differential Stab	Seg	Ly	M
12-30-39	103.2	103				4.76	11.5	12.640			11	64	16	10
12-31-39	103	102												
1- 1-40	103.4	102												
1- 2-40	104	101.4												
1- 3-40	105.4	100.4	±											
1- 4-40	103.8	101				4.60	13.5	12.800			4	62	30	4
				Sulfanil- amide										
1- 5-40	104.2	102	—	4 grams										
1- 6-40	103.6	102		4 grams										
1- 7-40	103.2	101.2		4 grams										
1- 8-40	103	102		4 grams										
				Rabbit Antiserum										
1- 9-40	103	101.2	+	10 cc.										
1-10-40	103	101.2	+	10 cc.		3.75	13.0	13.800		2	2	68	25	3
1-11-40	103	101	—	10 cc.										
1-12-40	104	100.8		10 cc.										
1-13-40	104	102		10 cc.										
1-14-40	104.2	100		10 cc.										
1-15-40	104.2	100.6	—	10 cc.										
1-16-40	104.2	102.2		10 cc.										
1-17-40	103.4	102		10 cc.		3.70	13.5	22.600			3	54	38	2
1-18-40	103.6	100.6	—	10 cc.										
				Sulfamethyl- thiazol										
1-19-40	103.2	100.6	—	9.5 grams										
1-20-40	104.2	102		7.5 grams		4.10	14.0	20.600			4	76	20	
1-21-40	103.6	100.6	—	10.5 grams	4.8									
1-22-40	102	99.6	—	10.5 grams	4.7	4.60	12.5	23.120			10	86	8	
1-23-40	103.2	102	—	9.0 grams	4.1	4.35	13.5	21.600						
1-24-40	103.4	102.2	—	12.0 grams	3.9	4.15	14.5	16.200						
1-25-40	104	103	—	15.0 grams	5.4	4.25	14.0	33.600						
1-26-40	103	101	—	12.0 grams	6.2									
1-27-40	103.6	102	—	9.0 grams	4.5									
1-28-40	103.2	102.2	—	9.0 grams	3.5	3.85	13.0	12.800			4	66	26	2
1-29-40	103.2	102.4	—	9.0 grams	4.5			18.600	2		70	26	2	
1-30-40	102.6	100.8	—	13.5 grams	6.6									
1-31-40	102.2	101.6	—	18.0 grams	2.3	3.35	11.5	28.260						
2- 1-40	102.4	100.4	—	18.0 grams	4.7									
2- 2-40	102.4	102	—	18.0 grams	5.0	4.68	12.0	22.800						
2- 3-40	102	100	—	18.0 grams	2.16	4.45	14.0	26.900						
2- 4-40	102	101	—	18.0 grams										
2- 5-40	101	100.6	—	18.0 grams	4.2	3.86	11.5	9.950						
2- 6-40	101.2	100.2	—	18.0 grams										
2- 7-40	101.4	101	—	18.0 grams	4.3	3.82	12.0	10.850						
2- 8-40	102	101.4												
2- 9-40	103	99.8	—		4.3									
2-10-40	101.4	100												
2-11-40	100.4	99.8												
2-12-40	100.2	99.8	—		0.5	4.10	11.0	13.650						
2-13-40	100.6	100												
2-14-40	102	100	—		0.5	3.61	11.0	8.250			12	65	20	3
2-15-40	103	98												
2-16-40	104	100		12.0 grams										
2-17-40	102.5	100	—	24.0 grams	2.6	4.08	11.0	27.100			9	74	14	3
2-18-40	102	98.6		24.0 grams										
2-19-40	102	99	—	18.0 grams	5.9									
2-20-40	99.4	99		18.0 grams										
2-21-40	99.4	99	—	18.0 grams	6.1	3.32	11.0	18.350						
2-22-40	99	98.2		18.0 grams										
2-23-40	99.8	97.8		18.0 grams										
2-24-40	100	98.2		18.0 grams										
2-25-40	98.8	98.8		18.0 grams										
2-26-40	99.2	98.8		18.0 grams										
2-27-40	99.2	98.8		18.0 grams										
2-28-40	99	98.8	—	18.0 grams	4.6	4.06	12.0	16.000			8	56	27	9
2-29-40	99.6	98.4		18.0 grams										
3- 1-40	99.6	98.2		18.0 grams										
3- 2-40	99.4	99		18.0 grams										
3- 3-40	99	99		18.0 grams										
3- 4-40	99	99		18.0 grams										
3- 5-40	99	98.2		3.0 grams										
3- 6-40	98.6	98.4												
3- 7-40	98.6	98.6												
3- 8-40	98.6	98.6	—		0.5	4.20	12.5	6.000			4	52	39	5
3- 9-40	100	98.6												
3-10-40	98.8	98.6												
3-11-40	98.8	98.4						7.600			6	66	30	4

Table 2. Case 2.

Date	Temperature High	Low	Blood Culture	Therapy Sulf- amethyl thiazol	Mg. Per Cent Sulfamethyl- thiazol in Blood	RBC in Millions	Blood Picture HB in Grams	WBC	E	B	Differential Stab	Seg	Ly	M
1-18-40	102.8													
1-19-40	104	101.8				4.00	13.5	16,600			2	74	22	2
1-20-40	102	100.8												
1-21-40	103.8	100												
1-22-40	102.8	100.6	-											
1-23-40	103.6	100												
1-24-40	103.6	101.6	-			4.35	14.0	11,200			8	68	24	
1-25-40	104.4	101.4												
1-26-40	102.4	100.4												
1-27-40	103.6	101.8	-											
1-28-40	104	99.4												
1-29-40	105.4	101.6	+			4.02	10.5	20,200						
1-30-40	104.6	102.4	+											
1-31-40	103	99.8												
2-1-40	103.6	102	+	11.0 grams				15,100	2		6	66	22	4
2-2-40	104	102.2	-	12.0 grams	1.0	3.31	11.0	13,450			10	62	21	2
2-3-40	104.2	100	+	12.0 grams										
2-4-40	103	99.4	-	12.0 grams		3.10	10.0	8,900			10	71	19	
2-5-40	102.2	100.6	-	18.0 grams	2.4									
2-6-40	103	100.6	-	24.0 grams	3.0	3.15	10.0	10,600			4	68	28	
2-7-40	102.6	99	-	24.0 grams	3.4	3.59	11.5	10,100			11	61	26	2
2-8-40	99.8	99.2	-	18.0 grams	3.0	3.38	11.0	12,350			1	69	29	1
2-9-40	101.6	98	-	24.0 grams	3.86									
2-10-40	101.2	99.2	-	24.0 grams	6.2	4.31	11.0	13,150			5	79	14	2
2-11-40	100.4	99.2	-	24.0 grams	5.2	3.75	10.5	12,250			8	67	19	4
2-12-40	99.4	98	-	24.0 grams	5.8	4.34	12.0	16,700	2		2	65	30	1
2-13-40	101	99	-	24.0 grams	5.8	3.58	11.0	12,250			5	75	18	2
2-14-40	100.2	98.6	-	24.0 grams	5.0	3.07	10.0	10,500			11	57	28	4
2-15-40	100.4	99.4	-	24.0 grams										
2-16-40	100.2	98.4	-	24.0 grams	4.8	3.51	9.5	11,000			10	62	29	1
2-17-40	101	99.2	-	4.0 grams										
2-18-40	100.4	98.4												
2-19-40	100.4	99.2				2.92	8.5	14,800			9	58	31	2
2-20-40	99.8	98.4												
2-21-40	100.8	98.4				3.65	11.5							
2-22-40	99.6	98.8												
2-23-40	100.2	99				4.12	11.0	12,800			5	61	31	3
2-24-40	101.8	98.8	-											
2-25-40	100.2	99.2												
2-26-40	100	99				3.49	11.0	17,300			7	65	22	5
2-27-40	100	99												
2-28-40	99	99												
2-29-40	98.8	99				3.65	10.0	14,500			9	61	30	
3-1-40	98.6	99												
3-2-40	100	99												
3-3-40	100.8	99												
3-4-40	99.4	99	-											
3-5-40	99.8	98												
3-6-40	99.8	99												
3-7-40	99.6	98												
3-8-40	101	98.8												
3-9-40	100	98.8												
3-10-40	102	98.6												
3-11-40	101.2	100				4.1	11.5	13,000						

this method of therapy was discontinued in favor of sulfamethylthiazol which was given in sufficient quantities to maintain a blood concentration of about 5 mg. per cent. Twelve grams daily were given at first but this was later increased to 24 grams to obtain the favorable blood level.

The patient continued to run a satisfactory clinical course until February 17 when a maculopapular eruption was noted on the face, neck, thorax and abdomen. The rash was thought to be toxic in character and the drug was discontinued; within forty-eight hours the rash had entirely disappeared. At present, the patient runs a low grade fever which is entirely accounted for by the osteomyelitis which is now receding.

In addition to the therapeutic agents mentioned both patients received blood transfusions freely during the acute stages; each received at least 250 cc. of citrated blood daily.

It is to be noted that the only toxic reaction was the maculopapular rash. No nausea, vomiting, febrile reactions, agranulocytosis or anemia, sometimes seen after administration of sulfanilamide or sulfapyridine, developed. There was no evidence of renal damage in either case.

The accompanying tables give a summary of the dosages of sulfamethylthiazol and the chief clinical and laboratory findings of the cases.

St. Louis County Hospital.

#### ARMY MEDICAL CORPS NEEDS ADDITIONAL PERSONNEL

"The office of the Surgeon General of the United States Army Medical Corps points out there are now authorized for the army of 280,000 an additional 1,283 Medical Reserve Officers," *The Journal of the American Medical Association* for June 29 says. "Of this number only 363 have been procured, leaving 920 still required. Approximately 600 medical officers will be needed for the additional 95,000 men. It is stated that the War Department will authorized active duty for lieutenants to age 35 and captains to age 40. The duty will be for one year, to be renewed as required. Physicians who are anxious to obtain some military experience, and particularly young physicians who are seeking at this time an outlet for their services, will find here an opportunity to accept service for one year or for more if they desire it to obtain experience, and an income, and at the same time fulfill a patriotic duty."



## FUTURE VISTAS IN THE FIELD OF MEDICINE

F. A. CARMICHAEL, M.D.

ST. JOSEPH, MO.

In the medical literature of the last decade may be found a progressive recognition of mental and emotional factors as these affect treatment, course and prognosis of somatic disease. The trend of medical education is rapidly changing, an indication that older and more objective methods of delineation are being supplemented by newer disciplines, tending to evaluate more properly not only objective and physically determinable pathology but the emotional and mental currents which are an important component of individual totality.

Only a scant ten years ago the general medical concept was somatic and objective to a degree that barely tolerated a place on the college curriculum for meager instruction concerning the more ominous disturbances of personality represented by the psychoses. The striking evolution in medical thought in this brief interval, representing as it does the transition of an important and much neglected branch of general medical teaching to one of major importance, on a parity with medicine and surgery in the time allotment of the leading medical schools of the country, must be regarded as significant. This change in the status of what currently has been termed the "Cinderella of Medicine" is not to be attributed to a growing importance in the minds of medical educators of the major disturbances of personality and behavior but to a better understanding of the correlation of physiologic and psychologic factors as they pertain to and influence human morbidity.

Researches in the physiology of sympathetic and parasympathetic nervous systems have tended not only to establish more clearly the relationship and influence of emotional states on functional activity but both directly and indirectly on metabolism and trophic states. Conflicting opinions arrived at after long and meticulous research by investigators of acknowledged ability have been harmonized through more recent study of the vegetative functions. Methods of relief of certain conditions that until quite recently have proven refractory to all methods of therapy have resulted in the arrest of the morbidity and mortality these conditions previously had engendered, the result of a clearer understanding of the importance of emotional factors reflected in trophic anomalies.

The difficulties encountered by research workers in all fields of medicine created by psychologic factors that interfere with exact and uniform results have long been recognized. To a large extent the accepted dictum that medicine is not an exact science is dependent on these emotional factors which seem to have been clearly demonstrated in the researches of Cannon, Pavlov and many others.

Up to the present time the practice of scientific medicine has been implemented with the basic sciences alone without any serious trend toward a recognition of psychologic factors. The frequent failure under the most faultless technic that often has been followed by improvement or cure under a methodology barren of recognized or accepted theory, to which the only possible explanation is the potency of the psychologic implication, should suggest to the thoughtful clinician the need of a reorientation that would include a proper evaluation of these factors.

Every practitioner of experience recognizes that much of the therapeutic success he achieves is due to the establishment of an emotional rapport with his patient which institutes faith and confidence in the therapy. This was the basis of success of the old time "family physician" whose predicted passing would occasion sincere regret. Equipped only with the empiric doctrine of his day, his therapeutic triumphs were in close parity with more modern and unquestionably more scientific methods.

The development of the microscope made possible the bacteriological researches of Koch and Virchow's cellular pathology, and their teachings and influence largely were responsible for the dictum that all disease exhibited changes in the minute cellular structure of organs and tissues and gave birth to the dogma that all diseases were due to specific organic pathology. To strengthen this materialistic conception, physiochemical contributions toward clarifying etiologic and pathologic problems resulted in the establishment of the laboratory era, the most notable advance of the last century. With these distinctly scientific additions medicine became progressively more intolerant of everything that could not be proven by the test tube or microscope and arrogantly brushed aside as unworthy of consideration all phenomena of morbidity not amenable to current objective analysis.

It is well for the physician to bear in mind the obligation of medicine to other sciences for much of the phenomenal achievement of the last half century. Chemistry, biology, physiology and physics made notable contributions to advancement of medicine, yet its attitude for the most part has been one of uncompromising objectivity and it has viewed with skepticism the contributions of social sciences.

Oliver Wendell Holmes, anticipating the gradual development of an intolerance that might crystallize into a dogmatism detrimental to progressive medical advancement, called attention to the fact that the medical profession was taught by a Jesuit how to cure ague; by a friar how to cut for the stone; by a soldier how to treat gout; by a sailor how to avoid scurvy; by a postmaster how to sound the eustachian tube; by a dairymaid how to prevent smallpox and by an old housewife how to capture the itch mite. Lest we forget to maintain a proper

attitude of humility, let us recall that the first authentic cesarian section was performed successfully by a swine gelder on his wife, and that in the early history of medicine the physician considered it beneath his dignity to handle the knife and relegated to the barber what then was considered a lowly but now an exalted branch of medical art.

While not infrequently brought face to face with morbid conditions in which it was impossible to determine definite etiology or pathology, it was easier to classify these unfortunates under the doubtful title of "neurotic" than to attempt to ferret out and minister to the psychologic background of their distresses. We temporized by the use of placebos, sedation or surgery according to the judgment, predeliction or capacity of the particular physician, or, classified their maladies as "functional" without serious effort to determine the foundation of dysfunction. We treated their "stomach trouble," "liver trouble" or other troubles without understanding and without great sympathy and when they failed to find relief from our ministrations and lost faith in "scientific" medicine they turned to the cultist who blunderingly and ignorantly administered the psychologic tonic that scientific medicine had failed to recognize or apply, all too frequently with surprisingly happy results.

Thus scientific medicine, smugly complacent in its materialistic achievements, has contributed consistently to the development of sectarian forms of medicine unburdened by ethical restrictions. The sole provocation for existence of these cults is the failure of general medicine to give consideration to those emotional components that are so frequently the foundation for somatic complaints vaguely denominated as "functional."

While the medical profession plumes itself upon its knowledge of organic pathology it is prone to overlook the fact that the possessor of the organ or the pathological condition is also to be considered. It must be admitted that present methods of treatment, despite all that has been contributed to scientific knowledge, are inadequate. The psychoneurotic group presenting neurasthenia, conversion hysteria, obsessional and depressive anxiety states are not amenable to mechanistic methods. The test tube and microscope are useless in determining their etiology, pathology or method of treatment. To a lesser degree one may consider other disorders presenting departures from normal function that one is content to classify as "idiopathic" or "essential," fully realizing such classifications are entirely meaningless. One passes over far too lightly the frequent incidence of diabetes in those who have suffered from long continued emotional tension or inward conflicts, the long recognized coincidence of nervous imbalance with certain types of hypertensive states, cardiac irritability, gastric hyperacidity and gastric and duodenal ulcers, hypermotility, mucous colitis and Addison's disease.

These are familiar to the progressive physician. While recognizing that psychic and emotional stresses may alter physiologic functions through their effect, direct or indirect, on endocrine balance, an example being the almost identical symptomatology of certain neurotic syndromes and thyrotoxic states, one is reluctant to consider other than the most obvious casual factors and too often to condemn that which he does not seek to understand. There still are many in the medical field who persistently cling to the idea of mental and physical dichotomy and who worship at the shrine of the objective, just as the farmer who must plant potatoes and wean his calves in a certain phase of the moon, the believer in "hexes" or the educator the horizon of whose vision comprehends the imparting of classical dogma only. We are not so far removed from the period when diagnoses were made by the horoscope or by "casting the urine" and the routine treatment of all conditions was by amulets, bleeding and purgation. Older members of the profession recall the wonderful successes of the true homeopath with his infinitesimal dosage that could have produced no other than psychic effect, the days of making a diagnosis by looking at the tongue and feeling the pulse, the days of treating fever as such without knowledge of its provocation or underlying cause or a realization that the febrile reaction was a defensive mechanism. These were accepted contemporary dogmas and although the contributions of allied sciences have disclosed their fallibility those who, like Semmelweis and John Hunter, departed from established doctrine of their day had their own troubles. It is said that in a treatise on medicine by Austin Flint, the introduction contained the statement, "This volume contains all that is known, possibly all that ever will be known, regarding disease and its treatment."

To assume that present day medicine has achieved the ultimate would be equally as presumptuous. Beyond the horizon of present day medicine there extends a vast unexplored region that must deal with the known interrelationship of psychic and emotional forces expressed through the medium of the sympathetic and vegetative nervous systems. Until these are recognized and properly evaluated, until we are able to discern in morbid processes something more than the objective phenomena presented, until we can conceive as Winters has so aptly phrased it, that "The patient is a unit of disease, an integer which includes and exceeds the fraction into which it can be, and is, too frequently divided," we are following the beaten path of a sterile orthodoxy.

State Hospital No. 2.

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It is improbable that human beings who have been completely submerged for more than ten minutes can be resuscitated, *The Journal of the American Medical Association* for June 29 declares.



# THE JOURNAL

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AUGUST, 1940

## EDITORIALS

### MEDICAL PREPAREDNESS

At the New York 1940 Session of the American Medical Association, the House of Delegates created a Committee on Medical Preparedness consisting of ten members of the House and five officers of the Association as ex officio members. This committee was appointed to establish and maintain contact and suitable relationship with all governmental agencies concerned with the prevention of disease and the care of the sick, in both civil and military aspects, in order to make available at the earliest possible moment every facility that the American Medical Association can offer for the health and safety of the American people and the maintenance of American democracy.

The members of the Committee, appointed by the Speaker of the House of Delegates, are: Dr. Irvin Abell, Louisville, Ky., Chairman; Dr. Charles A. Dukes, Oakland, Calif.; Dr. Roy W. Fouts, Omaha; Dr. Stanley H. Osborn, Hartford, Conn.; Dr. John H. O'Shea, Spokane, Wash.; Dr. James E. Paullin, Atlanta, Ga.; Dr. Walter G. Phippen, Salem, Mass.; Dr. Fred W. Rankin, Lexington, Ky.; Dr. Harvey B. Stone, Baltimore; Dr. Samuel E. Thompson, Kerrville, Texas. The ex officio members are Dr. Arthur W. Booth, Elmira, N. Y., Chairman, Board of Trustees; Dr. Austin A. Hayden,\* Chicago, Secretary, Board of Trustees; Dr. Nathan B. Van Etten, New York, President, American Medical Association; Dr. Olin West, Chicago, Secretary, American Medical Association; Dr. Morris Fishbein, Editor, *Journal of the American Medical Association*.

The Secretary of the Committee, Dr. Olin West, Chicago, in accordance with instructions of the Committee, communicated with the president, the secretary and the chairman of the council of each constituent state and territorial medical association requesting that these officials in each association nominate a member of the respective association to serve as a state representative of the Committee on Medical Preparedness of the American Medical

Association. Dr. Robert Mueller, 3115 South Grand Boulevard, St. Louis, was nominated the state representative from Missouri. This appointment was confirmed by the Committee. All activity of the Association in cooperation with the Committee on Medical Preparedness will be under the chairmanship of Dr. Mueller.

The Committee on Medical Preparedness in cooperation with the Council on National Defense and the surgeon generals of the United States Army, Navy and Public Health Service has submitted a request for information in questionnaire form to every licensed doctor of medicine in Missouri as well as those in all other states and territories. Each physician is requested to fill out correctly the schedule submitted in order that the information supplied may be transferred to punch cards so that complete information will be available of the extent to which each physician will be capable of aiding in various military, naval, industrial or civil capacity in the preparedness of our nation medically in the event of a national military emergency of great magnitude. The information supplied will be held strictly confidential and will be used only in connection with military purposes.

In order that proper records may be kept members are requested to notify the state Chairman the date the questionnaire has been returned to the American Medical Association. A return postcard has been sent to each member for this purpose.

The Committee on Medical Preparedness asks for cooperation of every physician in sending the questionnaire to the American Medical Association promptly.

"Cooperation and preparedness at this time constitute the duty of every American citizen who enjoys his citizenship and wishes to preserve the American democracy," an announcement of the Medical Preparedness Section of *The Journal of the American Medical Association* for July 13 declares in a plea for the immediate filling in and returning to the Committee on Medical Preparedness of the Association of the questionnaire.

"The physician who receives this questionnaire should take the necessary time and give the necessary thought to supply a complete and absolutely correct reply. It is the desire of the authorities, should an emergency arise, to place every individual capable of rendering aid in the position in which he can be of the utmost service, and also naturally where his training and his experience most deftly qualify him. It will be observed that opportunity is offered to state appointments in hospitals, together with the nature of the appointment, membership in special medical organizations, together with the nature of such membership, and whether or not the physician possesses the certificate of one of the examining boards in the medical specialties. There is also opportunity to provide complete information concerning the civil status of the physician concerned, whether or not he practices alone

\*Deceased.

or in association with other physicians, whether or not he is married and has children, and whether or not he has any physical incapacity which might prevent him from doing certain types of service.

"It is hoped that every physician will cooperate with the Committee on Medical Preparedness and with the United States government by filling out this blank and returning it at the earliest possible moment. Obviously, as physicians are needed, an attempt will be made to supply them through this mechanism. If, however, conscription should become necessary, it is important to realize that physicians who have failed to cooperate will have to take the chance of being assigned to any kind of service which may offer, and perhaps with far less possibility of rendering the quality of aid they are capable of rendering."

#### VITAL STATISTICS FOR MISSOURI

The birth rate for 1939 in Missouri was the highest recorded since 1931 according to a provisional summary of vital statistics released by the State Board of Health. The new high rate was 16.35 per 1,000 population as based on the total number of certificates received during the year.

In only one previous year was the death rate lower than in 1939. The crude death rate of 10.86 per 1,000 was slightly higher than the 1938 rate which was 10.67. This small increase in mortality is attributed in the main by the Board of Health to diseases of the older age groups as heart disease, cerebral hemorrhages, diabetes and nephritis. Death rates from the communicable diseases were generally favorable showing improvement in rates for typhoid fever, measles, scarlet fever, whooping cough, diphtheria and pulmonary tuberculosis.

The leading causes of death for 1939 with the rates per 100,000 population were reported as: heart disease 265.20, cancer 126.17, nephritis 107.55, cerebral hemorrhage 89.20, pneumonia 74.96, all accidents 68.96 and all forms of tuberculosis 45.65.

New low records were established for infant and maternal mortality rates. Provisional returns for 1939 showed an infant death rate of 43.48 per 1,000 live births against the previous low of 51.07 in 1938 and a maternal mortality rate of 3.42 against the 1938 low of 3.82.

#### AMERICAN MEDICAL DIRECTORY

The sixteenth edition of the "American Medical Directory" was issued in June. The volume contains the names of 195,104 physicians, an increase of 6,188 over the 1938 volume. Thirty-eight states and the District of Columbia show increases in the number of physicians. Because of death, 7,586 names were dropped and the names of 13,798 physicians, new graduates and physicians coming from foreign countries, have been added.

Refugee physicians seem to account for most of the increase in the Seaboard states. New York leads the list with a gain of 1,733, New Jersey

shows a gain of 380, Massachusetts 361 and Pennsylvania 324. California shows a gain of 631 and Florida 204. Louisiana shows an increase of 264, possibly influenced by the establishment of the Louisiana State University Medical Center. Mid-western states show gain with Illinois 246, Michigan 220, Minnesota 101, Ohio 201. While Missouri showed a gain of one member during the year 1939, since the last Directory was compiled Missouri shows a loss in the number of physicians as do Iowa, Kansas and Nebraska. The Southern states show decreases in the number of physicians as they have in each succeeding Directory; however, in the present Directory the decrease is less than in former years.

The Directory follows the plan of former editions and maintains the same accuracy of earlier editions. Physicians are grouped by cities in alphabetical order for each state. Biographical material on each physician includes year of birth, school and year of graduation, state license and year, notation if he is a diplomate of the National Board of Examiners and if he has been certified by one of the examining boards in medical specialties, membership in the American Medical Association, affiliations with special societies, military title or medical school professorship, home and office addresses and office hours. The same plan is followed for physicians in the dependencies and in Canada as well as American physicians in foreign countries. An alphabetical index of all physicians greatly increases the value of the Directory.

The Directory also gives information on medical schools, hospitals, medical libraries, medical publications, officers in government service, medical societies and state laws.

The American Medical Association publishes the Directory as a service to members and state associations and information in the Directory is available to all members through the office of the Missouri State Medical Association.

#### NEWS NOTES

Numerous complaints have been received by the Registry of Medical Technologists regarding an organization called the "American Medical Technologists," sponsored by a Mr. C. A. Bartholomew and purporting to issue certificates of qualification. It is soliciting membership especially among graduates of schools which are not approved by the Council on Medical Education and Hospitals of the American Medical Association and therefore are ineligible for examination by the standards of the Registry. This enterprise is not sponsored by any scientific society but appears to be motivated by commercial aspects. A \$5 registration fee is solicited from those desiring to join. The Registry for Clinical Laboratory Technicians was established in



1928 by the American Society of Clinical Pathologists to pass on the qualifications of laboratory technicians and to approve schools for training these workers. The Registry is recognized by the American Medical Association and other scientific and medical organizations.

Pursuant to its aim of raising the standards of surgery, the American College of Surgeons has published a twenty-four page "Manual of Graduate Training in Surgery" in which are incorporated the requirements for its approval of programs of training in general surgery and the surgical specialties in hospitals of the United States and Canada. The College recognizes three principal types of institutions as offering acceptable programs of graduate training in surgery: (1) universities or teaching hospitals supervised by departments of surgery of medical schools and graduate schools; (2) fellowships in recognized clinics and other organized groups, and (3) selected hospitals which by utilizing their own facilities to the fullest are able to carry acceptable programs through to completion, or which have supplemented their educational program, particularly in the basic medical sciences through affiliation with medical schools and graduate schools. The minimum standard for graduate training in surgery which is included in the "Manual" comprises (1) duration and objective of the program; (2) organization and supervision; (3) basic medical sciences; (4) clinical material, and (5) organized study. Dr. Dallas B. Phemister, Chicago, is chairman of the Committee on Graduate Training in Surgery of the American College of Surgeons, and Dr. Evarts A. Graham, St. Louis, is a member of the committee.

The next examination for physicians desiring to enter the Medical Corps of the United States Navy will be held August 19, 1940, at United States Naval hospitals at Chelsea, Mass.; Brooklyn, N. Y.; Pensacola, Fla.; San Diego, Calif.; Newport, R. I.; Philadelphia, Pa.; Charleston, S. C.; Great Lakes, Ill.; Mare Island, Calif.; Puget Sound, Bremerton, Wash.; and at the Norfolk Naval Hospital, Portsmouth, Va., and the Naval Medical Center, Washington, D. C. Graduates of class A medical schools who have had an internship in a civilian hospital and who are physically and professionally qualified may be commissioned in the permanent Medical Corps of the Navy as assistant surgeons with the rank of lieutenant (junior grade). Applicants must be less than 32 years of age at the time they receive their commissions, citizens of the United States, physically qualified for appointment as officers in the Medical Corps and must demonstrate their professional qualifications by competitive written, oral and practical examinations. The professional examination will embrace general medicine, general surgery, obstetrics and gynecology and preventive medicine and medical jurispru-

dence. The pay and allowance for assistant surgeons with the rank of lieutenant (junior grade) in the Medical Corps of the Navy is \$2,699 a year if the officer has no dependents and \$3,158 a year if he has dependents. Additional information may be obtained from the Bureau of Medicine and Surgery, Navy Department, Washington, D. C. Applications must be completed and received in the Bureau prior to August 1, 1940.

Dr. Evarts A. Graham, St. Louis, has been named chairman of a National Defense Surgical Advisory Committee, established by the National Research Council in collaboration with Surgeon General James Carre Magee of the Army and Surgeon General Ross T. McIntire of the Navy. The National Research Council was established after the United States entered the World War in 1917. One of the purposes of the committee will be the correlation of surgical specialties to eliminate confusion in distribution of cases which was experienced in 1918. Members of the committee are Drs. Warren H. Cole, Chicago; Frederick A. Collier, Ann Arbor; Irvin Abell, Louisville; Donald C. Balfour, Rochester, Minn.; George E. Bennett, Baltimore; Charles G. Mixter, Boston; Robert H. Ivy, Philadelphia; Herman L. Kretschmer, Chicago; E. W. Alton Ochsen, New Orleans; H. C. Naffziger, San Francisco, and I. S. Ravdin, Philadelphia. Dr. Irvin Abell, Louisville, a member of the National Defense Surgical Advisory Committee, is chairman of a Committee on Medical Preparedness appointed by the House of Delegates of the American Medical Association at the New York Session which was reported in the July issue of *THE JOURNAL*. Other members of this committee are Drs. Stanley H. Osborn, Hartford; Walter G. Phippen, Salem; Harvey B. Stone, Baltimore; James E. Paullin, Atlanta; Fred W. Rankin, Lexington, Kentucky; Roy W. Fouts, Omaha; Samuel E. Thompson, Kerrville, Texas; Charles A. Dukes, Oakland, and John H. O'Shea, Spokane. Five ex officio members are Drs. Nathan B. Van Etten, New York, President of the American Medical Association; Olin West, Chicago, Secretary; Arthur W. Booth, Elmira, N. Y., chairman of the Board of Trustees; Austin A. Hayden,\* Chicago, secretary of the Board of Trustees, and Morris Fishbein, Chicago, Editor.

## ORGANIZATION ACTIVITIES

### MEDICAL-HEALTH COORDINATOR URGED FOR NATIONAL DEFENSE

The appointment of a coordinator of medical and health preparedness for national defense under the National Defense Council recently created by the President is proposed by Thomas Parran, M.D., Surgeon General of the United States Public Health Service, in the Section on Medical Preparedness of

\*Deceased.

*The Journal of the American Medical Association* for July 6. Dr. Parran says his proposal is offered as a first step in meeting the vital needs of manpower preparedness of the nation.

"In the past," he declares, "there have been division of opinion and occasional dissension among our profession concerning methods proposed to bring better health and a higher standard of medical care to our people. In the face of danger it is the democratic way—even the herd instinct—to unite for the agreed objectives of safety.

"There is no time for dogged adherence to outworn patterns or for a major change in proved forms of medical practice. Medical science grows, expands, opens up new possibility for saving life and building strength. In the application of its basic sciences, medical practice must expand also to meet the new demands of the nation for self preservation.

"In the dictatorships, the state is served by sacrifice of the individual and enslavement of the men of science. If our democracy is to stand, we—as doctors, as health officers, as health workers, as citizens—of our own free will, because we know it is necessary, must put medical science to work now, fully, to make our men as good as our machines."

Pointing out that the recent appointment of seven persons to assist the government in national defense has taken in consideration the defense aspect of industry, both in raw materials and processing, labor, agriculture, transportation, the consumer and the research problems in the physical and chemical sciences, Dr. Parran says: "Yet so far as I know there has been no more thought than in 1917 of the application of medical and public health science to the physical problems of a nation arming. Yet for what cause is this nation arming if not on behalf of the men, women and children who compose it?"

The coordinator proposed by Dr. Parran would work with and through the surgeon generals of the Army, Navy and the Public Health Service as well as other federal agencies and national voluntary organizations.

Discussing the military importance of various diseases, he said: "Not one of the seven fine persons on the National Advisory Commission of the Defense Council, however, is aware of what this country can do to eliminate tuberculosis as a major obstacle to national security. We know that Hitler has put all of his active tuberculous together in factories to give—between dying coughs—a few months of service in munition making. If we plan well now, we shall not need such suicide squads for bomb manufacture."

## MISCELLANY

### PROTECTING INSURANCE IN WARTIME

The problem of maintaining insurance protection during times of war is well discussed in an editorial in the *New York State Journal of Medicine*,

July 15. The portion of the editorial dealing with this problem follows:

In considering the problems of defense mobilization and those of possible future active war service, the matter of physicians' insurance arises. Physicians as a group depend more largely on insurance to protect their families and their old age than almost any other group of citizens.

Yet among those first called upon to volunteer their services are the physicians. To those who respond are given commissions of the rank of first lieutenant or captain with net pay insufficient to maintain, in many instances, the insurance programs that they have set up as their principal security. These insurance programs have been based on their earning capacity in civil life and frequently represent their only resource and the future security of their dependents.

As soon as the physician enters military service his accident and life contracts are jeopardized. This would presumably be true if his entry were only for a training period. However, in case no waiver of liability existed, as in the instance of the government war risk contracts of 1917-1918, there would still be the matter of premium default.

In these circumstances he might avail himself of one of the following plans:

1. Automatic extended insurance at the face value of the policy for a period dependent upon the amount of cash reserve in the policy. This constitutes a lapse of the policy and means that the physician must show new evidence of insurability upon his return and perhaps reinstate the policy at a new age level.

2. Automatic premium loan—whereby the company lends the insured his own money at 6 per cent interest to pay the premiums when due, up to the point where the cash value is exhausted. It seems unlikely that in the depression period after his return he would be able to pay back this money or even to continue paying the 6 per cent interest plus the premiums. Therefore, he would probably be forced to cancel the policy eventually and would have meanwhile sacrificed the savings represented by that portion of the cash value that has been spent.

3. A paid-up insurance policy, at a much reduced face value dependent upon the amount of existing cash reserve. This would automatically greatly reduce the protection to his family during his absence and would likewise ruin the future protection for his old age.

To provoke discussion of this subject, we suggest that there might be arranged a basis of transfer from private to government insurance at cost with credits for earned cash surrender values. For if military service is to become a fixture of American life as seems probable, it is as well right now to contemplate a long-term program for physicians with respect to insurance.

In a matter of so much concern to the savings and future security of physicians and others, it seems to us highly important that the question of a premium moratorium for life and accident policies should be opened for discussion by this society and its component county societies without loss of time. A bill for compulsory military training is before Congress now.

### RARE CASE OF FUNGUS INFECTION

A unique and rare case of a fungus infection of the membrane enveloping the heart is cited by Henry Joachim, M.D., and Silik H. Polayes, M.D., Brooklyn, in *The Journal of the American Medical Association* for July 20. The case is rare in that it is the first to be reported and also one in which a diagnosis was made during life. Its history of infection is unique because the fungus organism was accidentally self injected by a morphine addict.



## COUNCILOR DISTRICT AND SOCIETY PROCEEDINGS

### COUNTY SOCIETY HONOR ROLL FOR 1940

(UNDER THIS HEAD WE LIST SOCIETIES WHICH HAVE  
PAID DUES FOR ALL THEIR MEMBERS)

#### HONOR ROLL

Chariton County Medical Society, December 5, 1939.  
Perry County Medical Society, December 11, 1939.  
Camden County Medical Society, December 18, 1939.  
Miller County Medical Society, December 20, 1939.  
Ste. Genevieve County Medical Society, December 22, 1939.  
Clinton County Medical Society, December 23, 1939.  
Moniteau County Medical Society, January 8, 1940.  
Macon County Medical Society, January 10, 1940.  
Dent County Medical Society, January 29, 1940.  
Dallas-Hickory-Polk County Medical Society, February 15, 1940.  
Barry County Medical Society, February 22, 1940.  
Audrain County Medical Society, March 22, 1940.  
Webster County Medical Society, March 25, 1940.  
Morgan County Medical Society, April 8, 1940.  
DeKalb County Medical Society, April 15, 1940.  
Newton County Medical Society, April 15, 1940.  
Howard County Medical Society, April 16, 1940.  
Lincoln County Medical Society, April 26, 1940.  
St. Francois-Iron-Madison-Washington-Reynolds County Medical Society, May 2, 1940.  
Adair-Schuyler-Knox-Sullivan-Putnam County Medical Society, May 16, 1940.  
Bates County Medical Society, May 24, 1940.  
Holt County Medical Society, July 8, 1940.  
Pulaski County Medical Society, July 8, 1940.  
Franklin County Medical Society, July 9, 1940.  
Christian County Medical Society, July 19, 1940.

## ASSOCIATE EDITORS: COUNCILORS OF THE TEN COUNCILOR DISTRICTS

### SECOND COUNCILOR DISTRICT

H. B. GOODRICH, HANNIBAL, COUNCILOR

Adair-Schuyler-Knox-Sullivan-Putnam  
County Medical Society

The Adair-Schuyler-Knox-Sullivan-Putnam County Medical Society met at the office of Dr. S. L. Freeman, Kirksville, on June 6, with Dr. E. V. Davis, Kirksville, presiding.

Dr. C. E. Henry, Kirksville, presented a paper on "The Medical Care of the Aged." The paper was discussed by Dr. W. J. Sullivan, Kirksville.

Mr. M. L. Daugherty, St. Louis, a representative of Group Hospital Service, Inc., explained the plan and work of that organization. The Society unanimously voted its endorsement of the plan and expressed the hope that hospitals of the area would accept the plan.

Dr. E. H. Magee, Unionville, was elected a member.

The following resolution was adopted concerning the death of Dr. G. F. Sneed, Kirksville:

*Resolved*, That in the death of Dr. G. F. Sneed we have lost a member who was deeply concerned in the successful and continued advancement of scientific medicine and one who had proved by his willing service and many sacrifices that he had at heart the best interest and welfare of his patients, and be it further

*Resolved*, That the members of the Adair Schuyler-Knox-Sullivan Putnam County Medical Society express their sorrow and sympathy in the loss of their esteemed brother by incorporating this resolution in the records of the Society and sending a copy to the Missouri State Medical Association and the bereaved members of Dr. Sneed's family.

The following members were present: Drs. C. E. Henry, W. J. Sullivan, E. V. Davis, S. L. Freeman, J. J. Wimp, R. O. Stickler, A. F. Miller, Kirksville; F. E. Luman, Edina; A. J. Drake, J. H. Keller and Ida M. Nulton, Lancaster, and J. S. Gashwiler, Novinger.

S. L. FREEMAN, M.D., Secretary.

### FIFTH COUNCILOR DISTRICT

W. A. BLOOM, FAYETTE, COUNCILOR

Cole County Medical Society

The Cole County Medical Society met at the Country Club, Jefferson City, June 25, with forty-five members and guests present. Among guests present were Drs. Andrew B. Jones, St. Louis; Paul S. Hines, Webster Groves; M. P. Ravenel, M. Pinson Neal, Frank G. Nifong, F. C. Suggett, Henry H. Sweets, M. E. Cooper, H. McClure Young, Columbia; A. R. McComas, Sturgeon; Henry Durst and R. N. Crews, Fulton; J. P. Burke, Jr., California; C. B. Nichols, Auxvasse, H. B. Pryor, Ashland; W. V. McKnelly, Chamois; J. C. Tinchner, W. H. Ziegler and A. C. Van Ravenswaay, Boonville; Kenneth E. Pletcher, Eldon; E. M. Rusk, New Bloomfield; G. L. Chamberlain, New Franklin. Dr. Irl B. Krause, Jefferson City, presided.

Dr. Andrew B. Jones, St. Louis, spoke on "Encephalomyelitis Disseminata, Acute, With Special Reference to Paralytic Accidents Occurring Following or During Antirabic Vaccinal Therapy." A round table discussion on the lecture and other topics on psychiatry followed.

JAMES A. HILL, M.D., Secretary.

### TENTH COUNCILOR DISTRICT

E. J. NIENSTEDT, SIKESTON, COUNCILOR

St. Francois-Iron-Madison-Washington-Reynolds  
County Medical Society

The St. Francois-Iron-Madison-Washington-Reynolds County Medical Society met at 7:30 p. m., June 28, at the St. Francois County Courthouse, Farmington.

Dr. Joseph Grindon, Jr., St. Louis, gave an excellent paper illustrated with lantern slides on "The Common Infectious Skin Diseases." An interesting discussion followed.

A letter was read from the National Physicians' Committee thanking the Society for its contribution.

Dr. N. W. Hawkins, Farmington, again urged members to contact their representatives and senator and determine their attitude toward the profession.

It was decided to adjourn during the months of July and August and the next meeting was set for September 27.

Members present were Drs. C. H. Appleberry and Paul L. Jones, Flat River; Reuben Appleberry, C. C. Ault, F. R. Crouch and N. W. Hawkins, Farmington; M. B. Barber, W. Harry Barron and Harold Frieheit, Fredericktown; Harold C. Gaebe, Desloge; R. E. Harland, Ironton; Marvin T. Haw, Jr., and Van W. Taylor, Bonne Terre; Joseph L. Thurman, Potosi, and John P. Yeargain, Irontale.

PAUL L. JONES, M.D., Secretary pro tem.

## WOMAN'S AUXILIARY

### WOMAN'S AUXILIARY TO THE AMERICAN MEDICAL ASSOCIATION

19th Annual Meeting, Cleveland

President, Mrs. V. E. Holcombe, Charleston, W. Va.  
President-Elect, Mrs. R. E. Mosiman, Seattle, Wash.

### WOMAN'S AUXILIARY TO THE MISSOURI STATE MEDICAL ASSOCIATION

President, Mrs. Stanley P. Howard, Jefferson City.  
President-Elect, Mrs. J. J. Drace, Chillicothe.  
Adviser, Dr. Herbert L. Mantz, Kansas City.

The eighteenth annual meeting of the Woman's Auxiliary to the American Medical Association was held in New York City, June 11, with Mrs. Rollo K. Packard, Chicago, presiding. New York City has no auxiliary so the State Auxiliary, with Mrs. Carleton Potter as convention chairman, acted as hosts and showed the delegates and visiting women many courtesies.

Reports of chairmen and state presidents showed that the Auxiliary had gained 9,647 *Hygeia* subscriptions (a loss of nearly 400 from last year); had held 5,000 public relations meetings; had held health essay contests in several states; several states had their own bulletins and many more had space in the state journals; had entertained doctors and their wives at conventions; had furnished speakers on health topics to lay groups; had made layettes for charity, and given some money; had promoted friendliness among doctors' families; and had adhered to their goal of "self-education." A fine exhibit of posters, yearbooks, scrapbooks and other material showed the work done during the year. The National Auxiliary now has 23,023 members, a gain of 242 members this last year.

The constitution was revised, Mrs. A. B. McGlothlan, St. Joseph, being chairman of the revisions committee. The handbook for state and county auxiliaries was also revised. One more state, Ohio, was organized, making thirty-eight states and the District of Columbia with active organizations.

Luncheon addresses were made by Dr. Rock Sleyster, President of the American Medical Association; Dr. Nathan B. Van Etten, President-Elect of the American Medical Association who was installed as President at the 1940 Session; Dr. Morris Fishbein, Editor,

and Dr. C. G. Heyd, Past President of the American Medical Association. Because of the work before the House of Delegates, Dr. Sleyster's talk was extremely short but he sent to all desiring it a copy of his talk, "The Doctor's Wife," presented in St. Louis.

There were 908 women registered at the meeting. The delegates from Missouri were Mrs. Robert E. Schlueter, Mrs. Martin Glaser and Mrs. August A. Werner, St. Louis; Mrs. C. H. Werner, St. Joseph; Mrs. W. H. Goodson, Liberty; Mrs. R. C. Haynes and Mrs. S. P. Simmons, Marshall; Mrs. B. A. Dumbauld, Webb City, and Mrs. F. E. Butler, Salem. Mrs. A. B. McGlothlan, St. Joseph, and Mrs. Stanley P. Howard, Jefferson City, of the National Board, were also present.

Missouri was honored by having one of her past presidents, Mrs. Charles H. Werner, St. Joseph, chosen as first vice president. She will have charge of organization. Mrs. R. E. Mosiman, Seattle, Washington, was chosen president-elect, and Mrs. V. E. Holcombe, Charleston, West Virginia, was installed as president. The next meeting will be in Cleveland.

## BOOK REVIEWS

**INJECTION TREATMENT OF Hernia, Hydrocele, Ganglion, Hemorrhoids, Prostate Gland, Angioma, Varicocele, Varicose Veins, Bursae and Joints.** By Penn Riddle, B.S., M.D., F.A.C.S., Assistant Professor of Clinical and Operative Surgery, Baylor University, College of Medicine, etc. With 153 Illustrations. Philadelphia and London: W. B. Saunders Company. 1940. Price \$5.00.

The past decade has witnessed a cyclic revival of the injection method in the treatment of varicose veins, hemorrhoids and hernia. The employment of more satisfactory sclerosing agents and improved technical procedures by competent ethical physicians has stimulated the use of injection treatment by an increasing number of practitioners.

Dr. Riddle's book is therefore timely. But it is more than that. It is sane, conservative, well written and sufficiently well illustrated so that the author's technic can be followed readily. The bibliography is adequate and reference is made to sources not in agreement as well as those which corroborate his methods.

To those who wish a rational guide to this form of therapy the book can be recommended. P. S. L.

**MINOR SURGERY.** By Frederick Christopher, S.B., M.D., F.A.C.S., Associate Professor of Surgery at the Northwestern University Medical School, Chicago, Chief Surgeon at the Evanston (Ill.) Hospital. With a Foreword by Allen B. Kanavel, M.D., F.A.C.S. Fourth Edition, Reset with 639 Illustrations. Philadelphia and London: W. B. Saunders Company. 1940. Price \$10.00.

This fourth edition of Christopher's Minor Surgery contains a wealth of new material and can be unhesitatingly recommended as a ready reference book.

Chapter VII includes a comprehensive discussion on varicose veins and ulcers with technic of ligation of saphenous vein.

Local anesthesia in fractures is recognized and given its proper place. He has included R. B. H. Gradwohl's method of sternal marrow aspiration for study of blood dyscrasias. Likewise, Bunnell's two charts, "Advisable or Correct Incisions," and "Pernicious or Incorrect Incisions," are illustrated.

This work of nearly 1,000 pages loaded with sound principles and treatment is by far the best book on minor surgery to date. W. H.



# THE JOURNAL

OF THE

## Missouri State Medical Association

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### PAIN RELIEF IN LABOR

JOHN W. HARRIS, M.D.

AND

RALPH M. WATERS, M.D.

MADISON, WIS.

Pain relief in labor is the most widely discussed subject in modern obstetrics and, at the same time, the most controversial. The reasons for the former are easy to understand. There is rightly a demand on the part of women for pain relief as well as an absorbing interest in the subject. This interest has been fanned into a veritable flame by a lengthy series of articles published in newspapers and lay magazines with a large feminine appeal as well as a number of books on the subject. The education of the public by lay authors dates back to the introduction of anesthesia in labor by James Y. Simpson. The story of the violent controversy participated in by the laity and clergy as well as by the medical profession is too well known to repeat here. The attitude of the public to the innovation was well expressed by the anonymous wag who pinned on Simpson's office door this notice: "Professor Simpson has gone to London to deliver the Queen. God save the Queen."

In this country the lay "education" of the public on the subject of pain relief in labor began in 1914 with an article published in one of the popular magazines in which the "marvels" of "twilight sleep" were most vividly and sensationally portrayed. This started an endless tide of publications which has grown with added vigor year by year. These articles have much in common; they are written by the laity and usually by some woman whose knowledge of the subject is based largely on her own personal experience while in an unconscious or amnesic state. However much the technical procedures may vary from publication to publication, each author is an enthusiastic propagandist for the particular method that she happens to be advocating at the time.

The effects of this propaganda are seen readily in modern obstetrics. The pressure on the physician in high places as well as low has become so great that many engaged in the practice of obstetrics are busy in an endless search for the most popular method of the moment, regardless of its safety or success. In many places the practice of obstetrics has become a competitive race to determine the most popular and appealing method of pain relief. The enormous increase in the incidence of operative deliveries is well known and can be attributed in part, at least, to inordinate attempts to secure painless labor. In increasing number American obstetric literature is being filled with papers on methods of treating fetal asphyxia and narcosis and the various mechanical devices for the treatment of such conditions are definitely on the increase.

A paper by Dr. Margit Insulander published in the *Acta Obstetrica et Gynecologica Scandinavica*, 1938, deserves the serious consideration of all physicians interested in the practice of obstetrics. The author spent four months in this country visiting twenty-three clinics for the purpose of investigating pain relief in labor. Her impressions of the subject as she saw it in the various leading institutions in this country are worthy of thoughtful consideration and in no wise reflect credit on American obstetrics. Two statements in her paper deserve quotation: "Their obstetrics are so fundamentally different from those which are generally accepted here. Not everywhere, but in many places I got the impression that as much intervention as possible—instead of, as here, as little as possible—were favorable in bringing forth the best result. As I have already mentioned, in many places they had 100 per cent operated deliveries, 70 to 80 per cent was a common average; a doctor who had shown 25 per cent was severely criticized because of his conservatism. All those to whom I mentioned the matter were of the opinion that the drugs which give painless labor, i.e., complete amnesia, decidedly increase the number of artificial deliveries. . . . The increased number of artificial deliveries renders unsuitable the introduction into our country of the American preparations. Their employment is pos-

From the Departments of Obstetrics and Gynecology and Anesthesiology, University of Wisconsin Medical School, Madison, Wisconsin.

Presented at the 83rd Annual Session of the Missouri State Medical Association, Joplin, April 29, 30, May 1, 1940.

sibly adapted to the very active American obstetrics." The leaders of obstetric thought in this country are open to serious criticism because they have done little or nothing to combat this vicious lay propaganda, nor have they seen fit to enlighten the medical profession in general as to the true status of the subject.

In any discussion of pain relief in labor two questions of fundamental import arise: The first, is pain relief justified? The answer is an unqualified affirmative one. Women today are entirely justified in demanding relief from the pain of labor and not only should it be afforded them, but one should bend every effort to discover safer and more perfect methods. Not only from the humanitarian standpoint but also because it is a recognized fact that a better delivery can be done under analgesia, it seems wholly indefensible to deprive any woman of some degree of pain relief at the time of labor.

If, then, pain relief is justifiable the second question is, can labor be made completely painless in every case with safety to mother and child? To this question one must today answer in the negative. In our judgment, on the answer to this question rest the greatest difficulties. Obstetricians are unwilling to admit freely and openly that they cannot make all labors painless without jeopardizing the welfare of mother or child or both. In the never ending search for various pain relieving drugs and varied methods of administering them, the fact that all drugs in this group, while differing in certain respects, have certain side effects in common has not been realized. These effects other than the depression of pain sensation are frequently overlooked and their dangers to mother and child rarely appreciated.

The autonomic nervous system is thrown out of balance easily by drugs which relieve pain. The reflexes may become either hypoactive or hyperactive and it is wholly impossible to predict with accuracy what will be the disturbance of reflex activity or its degree in a given patient from a particular drug. If the pharyngeal, laryngeal or vomiting reflexes are affected, serious disturbances in respiration may result with disastrous sequelae to both mother and child.

Loss of muscle tone in labor not only interferes with the effectiveness of expulsive effort but even more seriously obstructs the respiratory exchange through relaxation of tongue and pharyngeal muscles. The resulting oxygen want profoundly affects the baby as well as the mother.

Abnormal psychic excitation or depression in labor not only prevents the voluntary expulsive efforts of the patient but often renders proper aseptic technic impossible.

Opiates, barbiturates and other nonvolatile drugs, as well as inhalation agents in sufficient dosage to relieve pain, all cause depression of the respiratory centers of mother and child. Rarely can doses of nonvolatile agents adequate for pain relief be administered without measurable decrease in minute

volume pulmonary ventilation. A potent depressant of cell activity is oxygen want. At the time of delivery the child's respiratory center is usually subject to at least some depression from drug action and from trauma. If, at the same time, blood low in oxygen bathes the respiratory center, depression is further enhanced.

These side effects of the various pain relieving drugs commonly administered in labor have not received the consideration they deserve and lead to many clinical difficulties with both mother and child.

The worst curse of present day American obstetrics is the inordinately high incidence of operative deliveries. This is truly an age of "furor operativus" or, as it has been termed, "meddlesome midwifery." We are constantly hearing of prophylactic forceps, prophylactic version and the like. Prophylaxis means prevention and what these operations prevent is difficult to determine unless, as one well-known obstetrician has said, the only thing they prevent is loss of time on the part of the physician. Certainly they do not add to the safety of labor for either mother or child. One has great difficulty in disproving that a well conducted spontaneous labor still remains the ideal method of delivery. One of the greatest factors in the enormous increase in operative deliveries is the injudicious use of analgesic and anesthetic agents in labor. As has already been mentioned, operative delivery often becomes a necessity solely because the patient has been drugged to such depths that contractility of uterine and abdominal musculature has been interfered with seriously and voluntary cooperation between patient and doctor completely lost.

One has but to read the literature of recent years to be impressed by the increasing interest in the treatment of asphyxia of the newborn. New mechanical devices and various drugs and combinations of drugs are being recommended to overcome this condition. Frankly, we think it high time that thought be given to the prevention of fetal asphyxia rather than to its cure. As has been mentioned, all analgesic and anesthetic drugs produce respiratory depression in both mother and child. In other words, many babies are born in a state of acute oxygen want as well as deep drug narcosis. When the narcotic agent has been used to the point of necessitating operative delivery the baby's condition is further imperiled by the trauma of such deliveries. Serious drug narcosis of the baby can be prevented by keeping the dosage of such agents within safe limits. Oxygen want in the baby is readily discovered by careful auscultation of the fetal heart during and between contractions. The manifestations are marked disturbances in both rate and rhythm. We have found that the administration of oxygen to the mother between uterine contractions has a rapid and dramatic effect on fetal heart rate and rhythm. The technic is not difficult; all the apparatus required is a supply of oxygen



under suitable pressure and a face mask. By this procedure one is enabled to permit many patients to continue to spontaneous delivery and, at the same time, the incidence of anoxic babies is reduced.

It is wholly impossible for anyone to recommend one drug or one combination of drugs as best for universal application in the relief of pain in labor. That this is done explains much of the present chaos. There are three factors that demand serious consideration in the choice of pain relieving drugs and their mode of administration. The first is the two patients involved, the mother and the, as yet, unborn child. As one grows older in medicine he becomes increasingly impressed with the marked variations in the response of patients to various therapeutic agents and the utter impossibility of standardizing such agents to fit all patients. Nowhere is this better shown than in those drugs used to relieve the pain of labor. Unfortunately, the prognostic yardsticks by which we measure individual variations in response are, as yet, imperfectly developed. However, careful study of the patients—both mother and child—and the weighing of such factors as general body build and physical condition, the presence or absence of such complicating factors as hemorrhage, anemia, toxemias and the like, the duration of the pregnancy, the rapidity of the labor as well as others will enable one to fit with more accuracy the drug to the patient.

The second factor to which far too little consideration is given is the environment in which the labor is conducted. For example, we recently heard a well-known obstetrician addressing an audience composed largely of men engaged in general practice in rural areas and who conduct most of their deliveries in the home. The method of pain relief recommended was the use of pentobarbital sodium in such dosage that the resultant excitation was great enough to require sideboards on the bed and the constant presence of a trained attendant throughout labor. Furthermore, the drug was pushed to the degree that voluntary second stage expulsive efforts were abolished and the incidence of operative deliveries was 100 per cent. Another example of a different kind is the set-up with which we are blessed in Madison. In our medical school and hospital there is a separate department of anesthesiology headed by a full time professor and with an adequate staff of expert anesthetists, all of whom are graduate physicians. Thus there is on call at all hours one or more experts who share the responsibility of the choice and the administration of the various pain relieving agents in both the first and second stages of labor, who watch with the obstetrician the response of both mother and child to such drugs and who are quick to recognize and correct any untoward symptoms that may develop. This is the most nearly perfect set-up with which we are familiar. However, we should like to emphasize that neither of the two methods we used as examples can be transported with safety to the home

and, as a matter of fact, neither are they possible with safety in many hospitals today. We are unwilling to admit that no pain relief should be afforded to the patient delivered in the home as is practiced by at least one large institution in its home delivery service. However, we are forced to admit that the degree of safe relief is influenced tremendously by the amount of trained personnel available.

The third and last factor which we wish to emphasize is, in our judgment, the most serious of all. In the endless search for the ideal method of pain relief one is apt to change from drug to drug so rapidly that one never perfects himself in the administration of any one of them. One is likely to forget through the years that such tried and well-known analgesic and anesthetic agents as heroin, morphine, scopolamine, chloroform, ether and nitrous oxide in various combinations have afforded a great amount of pain relief with safety to both mother and child. Would it not be wiser, in at least the case of most of us, to perfect our methods of administration of these drugs whose actions are well known rather than engage in the endless search for something new? Perhaps you will attribute to us an attitude of defeatism. We do not intend it as such.

In conclusion, we should like to leave with you the following personal impressions.

The inordinate demand of the public for pain relief in labor has exerted such a degree of pressure on the medical profession that in many places it has become a veritable menace to safe obstetrics.

All pain relieving drugs commonly employed in labor can produce side effects which, unless recognized, thoroughly understood and controlled, may result in disaster to mother or child or both.

Complete pain relief in all cases of labor with safety to mother and child is not possible today.

The degree of pain relief that can be administered with safety is dependent on the response of the individual patient, the environment in which the labor is conducted and the experience of the physician.

1300 University Avenue.

#### VITAMIN P IS EFFECTIVE FOR PURPURA

Treatment with vitamin P proved effective in two cases of allergic purpura (minute hemorrhages under the skin), one of infectious and one of nutritional purpura. I. Newton Kugelmass, M.D., New York, reports in *The Journal of the American Medical Association* for August 17.

Vitamin P is found in the natural yellow pigment of fruits and vegetables. It affects the tone or elasticity of the capillaries or minute blood vessels of the body.

The allergic purpura in one child was found to be due to oversensitivity to certain foods. The instance of infectious purpura followed scarlet fever and the child suffering from the nutritional type was a premature infant who did not thrive on any milk formulas or breast feeding. The purpura of these patients cleared after vitamin P treatment.

## INTRATHYROID THERAPY FOR HYPERTHYROIDISM

### SECONDARY REPORT

FRANK M. POSTLETHWAITE, M.D.  
KANSAS CITY, MO.

The treatment of hyperthyroidism, both hyperplasia of the gland and toxic adenoma, remains one of the great challenges to medicine, particularly in the great number of cases in which there has developed the consequent disturbance of nutrition and cardiac symptoms or the thyroidectomized syndrome as described by Bergmann.<sup>1</sup> The surgical removal of the gland is frequently hazardous, is disabling and incapacitating for long periods, requires the highest surgical skill and hospitalization, carries a financial burden not easily borne by the average family and has an unenviable percentage of failures. The medical care has been slow, indifferent, indirect and absolutely no aid against adenoma. Consequently, a method of treatment which may be comparable to surgery, in selected cases, without the surgical expense and hazards is to be desired.

Observing the effects of the injection of sclerosing solutions into hemorrhoids in many hundreds of cases, one finds that within thirty minutes after injection into the tissues leukocytic infiltration takes place. In two hours lymphocytes begin to appear and in from eight to ten hours the general appearance is that of a subacute inflammatory process with lymphocytic infiltration and a serous exudate. After this stage fibroblasts appear and after from three to six days fibrosis develops.

Hypothyroidism and myxedema are the antitheses of hyperthyroidism. In myxedema the thyroid is atrophic and in the advanced cases it is hard and converted into a mass of fibrous tissue with a complete disappearance of the parenchymatous tissue.

With these two facts in mind, it occurred to me that if I could produce fibrous tissue changes in the thyroid gland in hyperthyroidism, beneficial results would follow.

Selection of a sclerosing agent was the next problem. Any agent which was corrosive, toxic or that might cause necrosis and slough could not be used for injection into the thyroid. In my earlier experiments I used an aqueous solution of phenol of varying strengths but, due to possibilities of unfavorable sequelae, I discontinued its use.

I am now using Sylnasol (Searle), a 5 per cent solution of the sodium salt of a vegetable oil extracted from the psyllium seed. Histologic studies show that it produces a mild degree of irritation with a minimum of the exudative phase of tissue reaction and a maximum stimulation of fibroblastic proliferation.<sup>2</sup> It does not produce necrosis and sloughing, is practically painless when injected and is nontoxic if injected intravenously as evidenced by its popular use in the injection treatment of varicose veins.

In a previous report, "Intrathyroid Therapy for Hyperthyroidism, a Preliminary Report,"<sup>3</sup> I stated that it has been my experience that inasmuch as one is dealing with an endocrine gland each case must have a complete examination from an endocrine standpoint and that the most satisfactory results have been obtained in the cases in which the course of injections into the thyroid was followed by a course of supportive endocrine therapy. Now, after another three years of experience, I again want to stress the importance of a thorough examination from a glandular standpoint. The interrelationship of the thyroid, the ovaries and the pituitary during a period of ovarian insufficiency or of pituitary hyperfunction is nothing more than an attempt to meet the demand by inhibition or stimulation.

If by producing fibrosis in the thyroid one reduces its circulation and, therefore, its activity, and lessens its output it is only reasonable to assume that one then must aid the system by supportive endocrine therapy to bring about a proper endocrine balance with the glands which are cooperative with the thyroid; namely, the pituitary and the gonads.

The technic of injection includes the following points:

1. Strict asepsis must be employed.
2. Locate the cricoid cartilage; from  $\frac{1}{2}$  to 1 centimeter below the cricoid normally is found the isthmus of the thyroid. At a point from  $1\frac{1}{2}$  to 2 centimeters laterally, with the needle directed posteriorly, the body of the gland can be injected. After puncturing the skin the needle is pushed downward through the platysma which usually offers slight resistance. The needle is inserted its full length through the capsule of the thyroid into the gland.
3. Deposit small amounts of solution at three or four points radially in fan shape locations from one puncture to the body of the gland.
4. After two or three treatments to the body of the gland, treat the upper and lower poles of the gland, attempting to produce fibrosis in the regions of maximum blood supply to the gland.
5. Each time the point of the needle is changed, make retraction on the plunger of the syringe in order to determine whether or not the point is within a blood vessel. The feel of the plunger of the syringe will indicate the nature of the tissue being injected. Do not use forceful pressure as that necessarily would indicate that the point of the needle is in fibrous tissue and continued injection there possibly would produce a pressure necrosis.

Due to the variability in the size and lobular thickness of the thyroid, extreme care must be used in making deep injections to prevent the formation of fibrosis of the posterior capsule of the thyroid which might involve the parathyroid glands and cause serious or troublesome complications.

In my injections, I use a Becton-Dickinson Security Needle, 26 gauge,  $\frac{5}{8}$  inch long. This needle has a small round ball near the hub of the shaft and in case of breakage of the needle, due to the pa-



tient's swallowing, as many of them do, the break always occurs between the ball and the hub, the ball preventing the broken point from becoming imbedded or lost in the tissue.

In this paper I am reporting the present status of the six cases recorded in my paper published in 1937,<sup>3</sup> and one patient of Dr. V. A. Lookanoff, Resident Physician, Middle River Sanatorium, Hawthorne, Wisconsin. The diagnosis in the following cases was confirmed by recognized clinics or clinicians. No other medication was given during my treatment of the thyroid in these cases.

#### REPORT OF CASES

Case 1. Mrs. J. W., aged 31, diagnosis of thyrotoxicosis made by Alfred Benjamin Dispensary and General Hospital in Kansas City, had been under treatment for four years. When I first saw her she weighed 101 pounds, pulse rate was 120, blood and urine normal, basal metabolic rate plus 20, and was taking from six to eight "nerve pills" daily on account of nervousness and was having frequent crying spells daily. She received her first injection on August 8, 1935, into the right lobe of the thyroid gland and again on August 13 and on August 20. Pulse rate on August 20 was 96. I did not inject her thyroid again until October 16. At that time she weighed 107 pounds, had cried only once and had taken but one "nerve pill" since the first injection. These four injections are the only treatments that this patient has received. She became pregnant in November and weighed 108 pounds. By March 27, 1936, her weight had increased to 136 pounds. Her pulse rate was in the upper 80's and her basal metabolic rate was normal. In latter part of June she lost her baby at seven months, the third stillborn child since her marriage. She has one living child, 14 years old. She was quite ill, had a blood pressure of 220 and was confined in the hospital about ten days. Before she left the hospital her weight was 119, her pulse rate 91 and basal metabolic rate minus 5. In a letter in November 1939 she stated that her weight was 125 pounds and that she was in perfect health. Figures 1 and 2 show Mrs. J. W. before and after treatment.

Case 2. Miss M., aged 24, with diagnosis of thyrotoxicosis made at General Hospital, pulse rate 110, basal metabolic rate plus 23 and weight 93 pounds, urine and

blood normal, had been unable to do any work for the last year. On March 30, 1936, she received her first injection into the thyroid gland, on April 2 her second and on April 9 her third injection. No more injections were deemed necessary. On April 16 her pulse was 68. On April 24 her basal metabolic rate made at the General Hospital was plus 3. On May 18 her pulse was 80 and she had gained 2 pounds. The patient stated that she was feeling much better and could do lots of things that she could not do four weeks previously. On August 5, 1936, her pulse was 75 and she stated that she felt fine. On August 17, 1936, her pulse was 80 and she stated that she had continued to feel fine, not at all nervous, was active and that she did not tire easily as she formerly did. On January 12, 1940, her weight was 100 pounds, her pulse 72 and she stated that she has worked continuously eight hours daily for the last two and a half years as a store cashier and office clerk. Her health since treatment has been perfect.

Case 3. Mrs. B., aged 19, had been under treatment at the West Side Clinic for the last several years. A diagnosis of hyperthyroidism had been made. She was 5 feet, 4½ inches tall and weighed 94 pounds. Her pulse rate for the last two or three years had been in excess of 130. Her basal metabolic rate was plus 32. Blood and urine were normal. I saw her first on July 14, 1936, when I gave her the first injection into the thyroid. She was given other treatments on July 21, 28, August 11, 18, 25 and December 18 and 29, a total of 7½ cc. Her pulse rate at the last treatment was 90 and she had gained 5 pounds. She stated that many of her friends remarked that she was looking much better. Her nervous symptoms had improved greatly and the size of the gland was considerably reduced. On September 23, 1936, her basal metabolic rate was plus 16. The patient stated that she felt better in the last month than she had felt any time in the last four years. In January 1937 she returned to me complaining of some gastric disturbances. Her weight was 102 and her pulse 100. I sent her back to the clinic and a complete gastrointestinal series was done and a diagnosis of gastro-enteroptosis was made for which she was treated at the clinic. On April 10, 1937, she was admitted to the General Hospital for observation because of a persistent fast pulse. At that time, her basal metabolic rate was plus 3, her pulse 100 and her weight 102 pounds. On May 3, a subtotal bilateral thyroidectomy was done. On May 18 her basal metabolic rate was 24 and her pulse 100. I saw her again in Feb-



Fig. 1. Case 1 in July 1935.



Fig. 2. Case 1 in July 1939.

ruary 1938. Her pulse rate was 120, weight 104 and she stated that she was not feeling any better than she did before her operation. On March 19, 1940, her pulse was 120, her weight 104 pounds and she stated that she was still nervous and felt that the operation was of little, if any, benefit. The pathologists report in this case states: "Several sections taken through the thyroid show the acini to be filled fairly evenly with pale or acidophilic type of colloid. They are lined by cuboid epithelium, sometimes the epithelium is flattened, sometimes the follicles show breaking into one another. The capsule of the gland shows thickening. In between the follicles there is definite fibrosis present."

Case 4. Mrs. F., aged 29, with diagnosis of hyperthyroidism made at General Hospital in Kansas City, Missouri, had a pulse rate of 160, definite tremors and definite exophthalmus. Urine and blood were normal and her weight was 98½ pounds. Her basal metabolic rate was plus 66. I gave her the first injection July 9, 1936. On July 14, 1936, injection was made into the right lobe. She then had a pulse of 136 and her weight was 100 pounds. On July 27, 1936, her pulse was 120 and injection was made into the left lobe. On August 5, 1936, her pulse was 110 and her weight 100 pounds. No injection was given. Friends had remarked that she looked much better and the patient stated that she felt that her eyes were not so "starey." Her nervous symptoms were not much improved. On August 24, 1936, her pulse was 105 and her weight 101 pounds. Other injections were made August 18 and September 19. Her weight had remained at 101 pounds and her pulse 105. On September 29 her pulse rate was 110 and she was given 1 cc. of antuitrin. On October 1 her pulse rate was 88 and her weight 105 pounds. She was given another injection of antuitrin. Treatments of antuitrin and corpus luteum were continued for the following two or three months. On October 24 her weight was 109 pounds and pulse 86. Her nervous symptoms were much improved and her exophthalmus reduced over 75 per cent. On November 13 her pulse rate was 86, her weight 109 pounds and her basal metabolic rate plus 25. In December 1937 her weight was 125 pounds, her basal metabolic rate plus 7 and her pulse 78. In December 1939 her weight was 132 pounds, her pulse 77 and she stated that she had not been ill for the last year, seldom

had headaches, was not nervous and felt fine. In May 1940 her basal metabolic rate was plus 6, her weight 130 pounds and her pulse 71. (Figs. 3, 4, 5.)

Case 5. Mrs. P., aged 32, was confined to the General Hospital in 1929 and at that time a diagnosis was recorded as follows: (1) angina pectoris, (2) partial heart block and (3) colloid goiter. This patient was 5½ feet tall and weighed 91 pounds. Blood and urine were normal. She had a definitely enlarged thyroid gland which interfered with swallowing and caused a choking sensation. She had frequent anginal attacks and continuous precordial pain. In August 1935 her pulse rate was 80 and her basal metabolic rate plus 12. An electrocardiograph showed a partial heart block. The patient had been in the hospital on three different occasions for operation on the thyroid but, when the cardiac condition was found, the operative procedure was deferred. She came to me in August 1936 insisting that I treat her thyroid. She received seven injections into the gland and after treatments she experienced no difficulty in swallowing and her choking sensation was entirely relieved. She had only one "heart attack," no precordial pain and no dyspnea on exertion after the second treatment. The gland was reduced at least two thirds in size and she had gained 5 pounds in weight. This gain in weight was in spite of the fact that she was working as a cook in a small restaurant from twelve to fifteen hours daily and the temperature in Kansas City was in excess of 100 degrees daily with a maximum of 113 degrees. Dr. Graham Asher, cardiologist, stated that an electrocardiograph made on October 31, 1936, compared with one he made in August 1935 showed a definite improvement in conduction. In May 1937 this patient's weight was 105 pounds and her pulse was 70. On March 8, 1940, her weight was 104 pounds, her pulse rate 75 and she stated that the last heart attack she had had was in June 1939. She had had only three in the last year and those were much less severe than the attacks previous to the treatment of her thyroid. The size of the gland had reduced at least 75 per cent.

Case 6. Mrs. R., aged 47, was operated upon in 1932 for toxic thyroid. At that time the left lobe was removed and the right lobe ligated. She was well and active until June 1936 at which time her husband died. The surgeon who operated upon her referred her to me



Fig. 3. Case 4 in July 1936.



Fig. 4. Case 4 in November 1936.



in November 1936. She was extremely nervous, had a basal metabolic rate of plus 15, a pulse rate of 140 and her weight was 142 pounds. Blood and urine were normal. She complained of nervousness, loss of weight, palpitations of the heart and a slight enlargement of the right lobe of the thyroid. She received the first injection of Sylnasol, November 24, 1936, and the last April 9, 1937. In October 1937 her weight was 165 pounds and her pulse 82. The nervousness and the palpitations of the heart were relieved completely and the size of the gland was reduced greatly. On February 13, 1940, her weight was 155 pounds, pulse 80, basal metabolic rate plus 8, and she stated that she felt fine, not at all nervous and that she had had no more choking spells. She had had no illness in the last two years and the gland is much smaller.

Case 7. Dr. Victor A. Lookanoff, resident physician of the Middle River Tubercular Sanatorium at Hawthorne, Wisconsin, wrote to me in July 1937 saying, "We have a patient in our sanatorium who is awaiting thoracoplasty but is unable to receive her surgery because of complicating thyrotoxicosis. Her pulse is over 100 on bed rest. Her basal metabolic rate is plus 27 and there is a definite exophthalmus and slight enlargement of the gland." On February 7, 1938, Dr. Lookanoff wrote to me stating that the injections were begun on August 28, 1937, and continued until December 21, 1937. Following these injections there was noticed a marked diminution in the size of the gland. The exophthalmus had disappeared entirely and the patient had gained 9 pounds in weight. There was almost complete absence of the nervousness previously complained of and the pulse rate was between 70 and 80. The basal metabolic rate was plus 7. She has since undergone one stage of thoracoplasty without any trouble whatsoever. On January 9, 1940, Dr. Lookanoff wrote me as follows: "... in answering your letter of December 28, in regard to the case of thyrotoxicosis, which we injected with Sylnasol, I would like to say that she has had a complete thoracoplasty on the right side, that is four stages, and she went through the operations very nicely. Her basal metabolism, previous to the injections on March 4, 1937, was a plus 22; on June 28, 1937, plus 27; on November 1, 1937, plus 22.5; on January 19, 1938, after the completion of her injections, plus 7. I have not had occasion to take any more basal metabolism readings on this patient, but the various

symptoms of which she complained before her injections, have improved markedly, there being none of the tremor which was present previously and the pulse is in the low 80's even when she is up and around. I feel that she is, clinically, free now of any symptoms suggestive of hyperthyroidism.

"Where operative interference is not possible, as in this case, I feel that this method is one which will certainly gain in popularity as time goes on."

#### CONCLUSIONS

1. The treatment is suggested for the relief of the symptoms of hyperthyroidism, both hyperplasia of the gland and toxic adenoma.

2. In experienced hands the treatment is a harmless procedure and, in the majority of cases, may be given at the office.

3. It does not produce the shock which accompanies surgical procedures. It is in most cases non-confining and not disabling.

4. It is practically painless. The only after-effect is a soreness or stiffness of the neck for from four to eight hours.

5. If the injection is made well within the gland, there will be no adhesions around the gland and subsequent operation, if necessary, will not be made more difficult because of adhesions.

6. Small infiltrations, frequently repeated, with an occasional rest period and followed by a course of supportive endocrine therapy, when necessary, are preferable to massive injections.

7. Five years' experience in intrathyroid therapy for hyperthyroidism has been an interesting and valuable experiment. I have treated more than twenty-five cases and in every case of toxic hyperthyroidism in which I have had full cooperation of the patient, I have obtained a definite improvement of symptoms. In one case which I believe would be classified according to Hertzler's "Surgical Pathology of the Thyroid Gland" as a nontoxic nodular thyroid, nine injections into the gland were of no apparent benefit. They did not produce any aggravation of the symptoms or increase the size of the goiter.

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#### BIBLIOGRAPHY

1. Bergmann, Victor H.: Study of Thyroidectomized Patients. *J. Missouri M. A.* 33:57-59, 1936.
2. Rice, Carl O.: The Rationale of the Injection Treatment of Hernia. *Minnesota Medicine*, 18:623 (September) 1935.
3. Postlethwaite, Frank M.: Intrathyroid Therapy for Hyperthyroidism: A Preliminary Report. *J. Missouri M. A.* 34:53 (February) 1937.

I wish to acknowledge valued assistance given to me in this work by Dr. Victor Henry Bergmann, endocrinologist; Dr. Graham Asher, cardiologist, and Dr. Ferdinand C. Helwig, pathologist, and Dr. Victor Lookanoff for his letters and interest.

#### ABNORMALITIES OF THE EYELIDS

While some eye defects can be inherited, abnormalities of the eyelids are rarely due to heredity, *Hygeia*, *The Health Magazine* states in reply to an inquiry. "Faults of diet, especially deficiency of vitamins during pregnancy, might cause eye defects, but such cases are almost unknown in this country," *Hygeia* says. "There is little reason to think that fright, or other shock during pregnancy, causes defects of the eye."



Fig. 5. Case 4 in May 1940.

## ADVANCES IN THE TREATMENT OF CANCER OF THE CORPUS UTERI

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There are two features of the advancing treatment of corpus cancer which I wish to bring before the society for discussion. The first deals with an established improvement and how it may be disseminated into practice generally. The second deals with a treatment problem still in process of solution; namely, how to make good distribution of multiple radium units in the uterine cavity.

### DISSEMINATION OF ESTABLISHED IMPROVEMENTS

Improvement in the treatment of corpus cancer cases involves two things: first, the working out of the improvement and, then, the dissemination of that improvement into the general practice of the profession. Gynecologists are interested in both phases for on them falls the duty of pushing each to its full capability of saving life.

Specialists in all departments of medicine have a wonderfully stimulating life work. They are pioneers exploring new lands, seeking the undiscovered, overcoming the difficulties which beset all pioneering and finally bringing new hope and life to those dependent on them for that service. Like most pioneers, they are individualists with the helpful driving qualities and the annoying dictatorial tendencies which develop in those who must stand alone amid uncertainties and grapple with them. So it is little wonder that medical meetings develop sharp differences of opinion on debatable points. It is a mark of the independent thinking and study which is necessary to the solution of difficult problems.

However, one must not give all attention to the debatable points. There is such a tendency to do this in gynecological meetings, both local and national, that the members of the general profession who necessarily depend on gynecologists for guidance in the handling of gynecologic conditions are often left in a quandary as to what is really settled and dependable in the way of advances.

Naturally, the important work of devising new methods of treatment is interesting but one must remember that the devising of an improved method is only half of the process of bringing that benefit to patients generally. The members of the speciality of gynecology and obstetrics comprise only a small part of the great army of hard working physicians and surgeons who are daily doing their best to alleviate suffering from pelvic disease. Gynecologists see only a small proportion of these patients, the greater number of whom must depend for treatment and guidance on their local physicians and surgeons. Consequently, comparatively few of them receive the benefit of important advances until the

established phases of those advances are separated from the confusing maze of technical debate and are put before the general profession in clear and usable form. Even then the shift to radical improvements is slow for the members of the profession possess a healthy conservatism which requires that the new must be proved and time tested before it safely may displace the old, and this convincing presentation must reach each member before his patients receive the benefit. The time is at hand for such an educational campaign for the improved treatment of patients with corpus cancer.

In attacking a difficult problem it often is helpful to recall the steps and strategy by which a similar problem was handled successfully. The shift in the treatment of cancer of the cervix from operation to radiation may be studied with benefit in this connection. Those who are just coming to activity on the stage of medicine can hardly appreciate the turmoil and differences of opinion and upsetting uncertainties of the period which accompanied this radical shift in the treatment of an important disease. The details of the long and trying struggle are now part of medical history—the early experimentation with radiation, the high hopes and mistaken claims and consequent reaction, the recrudescence of radiation and its emergence as a dependable remedy in inoperable cancer, the improvements which made it a competitor of operation in the operable cases, the later advances which made it superior to operation in the cure of this insidious form of cancer which reaches the parametrium early and without warning, the critical debates, the gradual adoption of radiation as the main reliance by gynecologists one by one, and the eventual diffusion of the knowledge of this established treatment into general daily practice. All this may be found in the literature of the period.

That fight has been won. Some echoes are heard occasionally but the heat and strain of battle have passed. No more does one have to argue with a patient or employ a lengthy explanation to convince her and the family that radiation should be employed. Formerly, the patient's physician sent her for hysterectomy for the cervix cancer and the family was sure that removal of the uterus would of course cure the cancer of the uterus and that that was the only treatment which could cure. Now, the patient with cancer of the cervix comes with a different outlook. She and the family know something about radiation and are prepared to accept that treatment when advised because the family physician has explained, if they asked him, that radiation can reach beyond the limitations of the knife. That general shift has been accomplished.

Of course, within the framework of the present treatment of cervix cancer gynecologists and other workers are pushing investigation in many directions in the eternal struggle for improvement. For example, better distribution of radiation to the outer parametrium by way of the vaginal vault or through an abdominal incision is a live subject, as is also the

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Read at the meeting of the St. Louis Gynecological Society, April 11, 1940.



question of supplementary operation in certain special conditions and complications. These and other unsettled problems furnish an abundance of stimulating investigation and critical debate. But the point I wish to call attention to is that a definite improvement was established in the practice of gynecologists and then gradually diffused, by example and precept, throughout the general profession.

At present a somewhat similar improvement may be made in the general handling of corpus cancer cases provided the matter is approached earnestly and in a practical way. Two important steps in the successful cervix cancer campaign just cited were as follows: (1) Personal testing was done to a convincing extent. When radiation had reached a reliable development, certain gynecologists determined to give it a thorough clinical trial in their own work with the result that the patients received the benefit and each such gynecologist built up for himself dependable conclusions amid the general uncertainty. Then, having convinced themselves, they became helpful factors in shaping the plan of treatment adopted by gynecologists in general. (2) Crusading for general adoption was the second step. As previously stated, it is a long step from the use of an improvement by specialists to its incorporation into general daily medical and surgical work. However, this important phase was pushed to a successful conclusion by the crusading spirit of gynecologists and other interested workers who hammered at the task persistently and at every opportunity presented the facts and plans of the improved treatment.

Consider now the application of these two steps to the present situation in regard to cancer of the corpus. An improved plan of treatment, namely, preoperative radiation, has been worked out and clinically tested and is in use, the details differing somewhat with different workers. What remains to be done is to settle on the principles and main steps which can be approved and advocated and then crusade for the diffusion of knowledge of the improved treatment and the application of that knowledge throughout daily medical practice.

The task will not be as difficult as in cervix cancer. There the shift was to radiation instead of operation, whereas in corpus cancer the shift is simply to radiation in addition to operation. Furthermore, physicians and patients are now radiation-conscious and hence it is no longer necessary to explain and argue that radiation in suitable cases can be as effective as the knife in the cure of cancer. However, to bring about general use of the improved treatment will require the effective advocacy of a clear-cut and practical plan. The local surgeon, to whom the corpus cancer cases are first brought and who is working hard to give his patients the best service, is not going to depart from his usual plan of immediate hysterectomy unless he sees definite evidence of agreement among gynecologists that preoperative radiation gives the patient a better chance of cure.

The evidence of such agreement would be, first, the uniform employment of preoperative radiation in the practice of each and, second, the advocating of it and statement of its advantages whenever opportunity occurs in professional contacts. It then soon would become general knowledge that preoperative radiation, by radium and roentgen ray, reduces operative peritonitis by eliminating the infective uterine discharge, and lessens operative implantation metastases by preliminary devitalization of cancer cells. Until then, most patients with corpus cancer will not receive the benefit of this advance in treatment.

The most effective teaching is by example. The technical discussions and exchange of experiences in meetings are helpful to the gynecologist in the formation of his own conclusions, but to outside physicians the discussions are largely a confusing mass of contradictory statements. They necessarily lack the background of special training and experience which enables interpretation and evaluation from various angles of what is said. For this interpretation and evaluation they depend on watching the practice of those gynecologists whom they feel can separate the wheat from the chaff. So the dissemination of this definite improvement in corpus cancer treatment should be pushed by uniform personal use and by constant counsel.

#### DISTRIBUTION OF RADIUM IN UTERINE CAVITY

When a carcinoma dose of radium is given in the endometrial cavity, it is advisable to distribute the

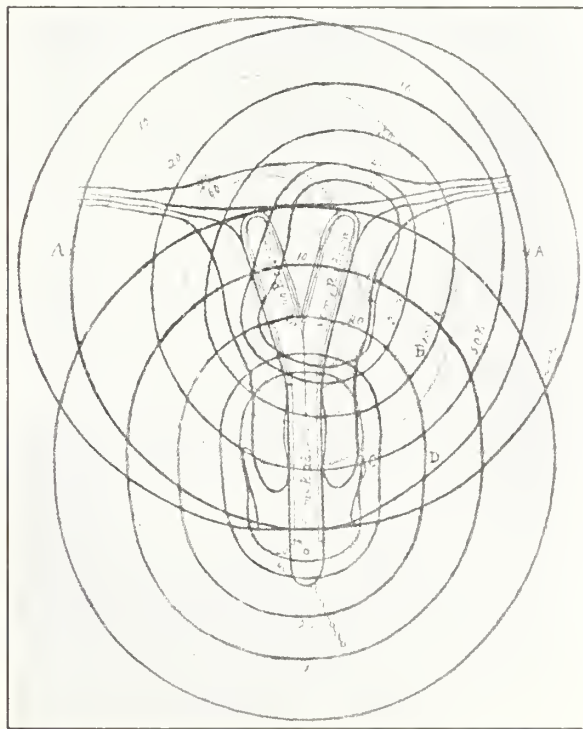


Fig. 1. The "Y-shaped radium filter" devised by Schmitz<sup>1</sup> for the treatment of corpus cancer. (Schmitz in *American Journal of Obstetrics and Gynecology*.)

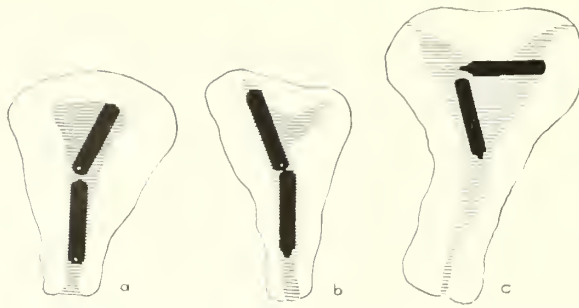


Fig. 2. Experiments in radium distribution by Sampson.<sup>2</sup> "The influence of the normal variations in the size and shape of the uterine cavity on the intimate application of radium to all portions of the uterine mucosa. Tracings of skiagrams of three uteri into the cavities of which a solution of sodium iodide has been injected through the cervix; and two capsules, in a rubber tube in tandem formation, have been introduced as in the radium treatment of carcinoma of the body of the uterus. In uterus a the cavity is small and of the triangular type; the capsules would be in close proximity to carcinoma of any portion of the entire mucosa. In uterus b the cavity is of the 'Y' type but fortunately is small. In uterus c the cavity is also of the 'Y' type but larger than the preceding one. The first capsule might have reached one cornu leaving the other unexposed. In this instance, however, it evidently struck the septum between the two cornua and was turned back into the uterine cavity. Capsules in single tandem formation cannot reach all portions of a uterine cavity of the 'Y' type. Carcinoma is frequently situated in one or both uterine cornua." (Sampson in American Journal of Obstetrics and Gynecology.)

radium in several centers to provide more even radium radiation of the uterus and to avoid point devitalization of the uterine wall with consequent sloughing areas and infection. Considerable attention has been given by different workers to devising ways of distributing the radium and holding the containers in place. But it is a difficult problem and the methods ordinarily used are far from satisfactory.

One of the first attempts at systematic distribution of radium containers in the uterine cavity was made by Schmitz,<sup>1</sup> who devised the "Y-shaped radium filter" shown in figure 1 for the treatment of carcinoma of the corpus. Another method of distribution, and the one which is adaptable to the usual hospital supply, is to use supplementary small radium capsules in the lateral horns beside a tandem in the center. The difficulty is to hold the lateral capsules in place while the tandem is being introduced. Unless some effective device is employed for keeping the supplementary capsules in the lateral area, they will be displaced as the tandem is pushed in. The string ordinarily tied to the capsule is satisfactory for its removal but is no help in keeping it in the desired area in the cavity. Wire has been used instead of string. This gives a little better control but the wire fails to keep the capsule in place when the tandem is introduced.

Sampson<sup>2</sup> conducted some interesting experiments with removed uteri. He injected the cavities with 20 per cent sodium iodide solution and then took roentgenograms, thus showing the great differences in shape and size of uterine cavities. Along with this, he introduced a radium tandem to show the relations of the tandem capsules to the lateral horns (fig. 2). Notice that they assume different

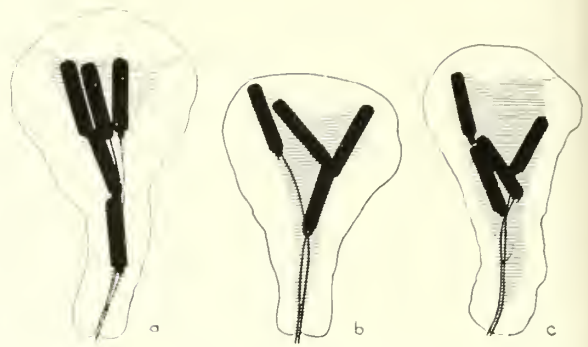


Fig. 3. Supplementary capsules and tandem. "Tracings of skiagrams of three uteri in which an attempt was made to first place a capsule, with wire attached, in each cornu and between these two or three capsules, tandem formation, so that they would extend from the fundus well into the cervical canal. In uterus a although the capsules cover the entire mucosa much better than three capsules in tandem formation, the capsule intended for one cornu either failed to reach its destination or later became displaced. In uterus b with a cavity of the 'Y' type a capsule is well placed in each cornu. In uterus c the capsules either failed to reach their destination or subsequently became displaced. In all but small uterine cavities of the triangular type the placing of a capsule in each cornu and additional capsules between them will cover the entire mucosa better than two or three capsules in single tandem formation. Since failure in properly placing the capsules may occur when they are introduced in uteri after hysterectomy, it would seem that similar failures would occur more frequently in uteri which had not been removed." (Sampson in American Journal of Obstetrics and Gynecology.)

relations in different cavities, but always one horn is missed and sometimes both. He then tried placing a supplementary capsule in each horn. He attached a wire to each supplementary capsule, hoping thereby to keep the two in place as the tandem was introduced between them. Figure 3 shows that the wires failed to hold the supplementary capsules in the desired areas, one horn being missed in two of the three uteri.

The solving of the problem of providing a practical method for satisfactory distribution of radium units in the uterus has an important bearing on the promotion of the more general use of adequate preoperative radiation in corpus cancer cases for one cannot expect wide adoption of this improvement until there is some practical plan of using the ordinary hospital radium supply for the purpose. The hospital radium supply, purchased and arranged to meet the varied needs of a general hospital, consists usually of one or two 50 mg. capsules, two to four 25 mg. capsules, perhaps some smaller capsules or plaques and a number of needles. In some cases, the large 50 mg. unit is a shell containing needles, which can be taken out and used separately after wrapping with sheet lead to raise the screening to the equivalent of 0.5 mm. of platinum.

Such a radium supply limits the method of intra-uterine distribution to that by tandem and supplementary capsules placed laterally. In planning to hold an accessory capsule in the lateral area, it is necessary to guard against displacement in four directions—up, down, forward and backward. About a year ago I devised a form of wire distributor which I have been using and improving and now feel justified in recommending for this purpose. Two of



# Special Wire Distributor (Made of soft Weaving Wire No.18.)

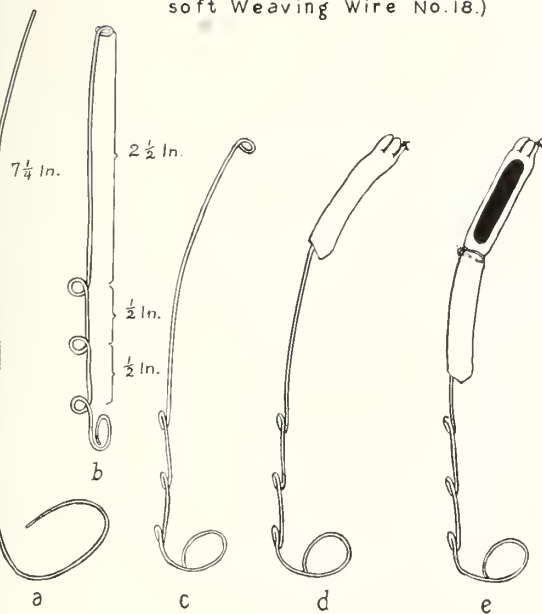


Fig. 4. Details of the wire distributor by Crossen. a. The piece of pliable wire,  $7\frac{1}{4}$  inches long, from which the distributor is made. b. The completed distributor turned so as to show the three eyes for adjustment to uterine cavities of different length. c. A general view showing the loop handle at right angle to the row of eyes and also the eye at the inner end to which the tubing is stitched. d. Rubber tubing for a single capsule in place and stitched securely to the eye at the end of the wire. e. A two capsule length of tubing in place and one capsule fastened in it.

these small wire distributors are employed along with the tandem to hold the supplementary capsules in place in the lateral portions of the cavity.

The distributor is made of ordinary flexible wire obtained at the hardware store in small rolls. It is called "soft weaving wire" and No. 18 was found to be the most satisfactory size. Details of the distributor are shown in figure 4 and steps in the making are shown in figure 5.

The up and down movement or depth of the distributor in the uterus is controlled by a suture which passes through the cervix and through an eye of the distributor. Long or short uterine cavities of course require long or short distributors. At first I made them of different lengths to meet the requirements of different cavities, having the different lengths sterilized and ready to select from after the depth of the cavity had been measured. Later I found that the addition of three eyes, half an inch apart as shown, worked satisfactorily in adjusting one initial length of distributor to the different sized cavities, the fixation suture being passed through the first or second or third eye as required by the depth of the cavity in the particular case. So a uniform length of wire is now used in making the distributors. The straight wire is  $7\frac{1}{4}$  inches long and when the distributor is completed it has the proper length for use in cavities from  $2\frac{1}{2}$  to 4 inches in depth and with slight adjustment it may be used in shorter and longer ones. Figure 6

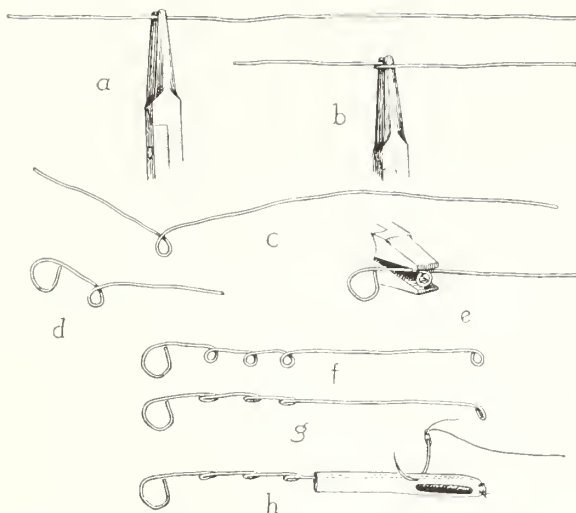


Fig. 5. Steps in making the distributor. The wire is grasped firmly with a round nosed plier  $1\frac{1}{8}$  inches from the end as shown in a and the long end of the wire is brought around under and then over the plier inside the short end, as indicated in b. A pull on the two ends of the wire makes the eye, as in c. It is well at this stage to make the loop handle shown in d as this is convenient for holding the wire in the subsequent steps. The eye is then squeezed to  $\frac{1}{8}$  inch diameter with square nosed pliers as indicated in e.

This process is repeated at half-inch intervals making the three eyes shown in Fig. 4 b, adjustments to measurements being made during the progress. By always bringing the long end of the wire inside the short end, the eyes are made so that there is no projecting margin to catch the end of the tandem as it is pushed in between the two distributors in the cervix.

The next step is to make the eye at the end of the distributor as in f and bend it out as in g. Then the loop handle is turned at a right angle to the row of eyes and pressed slightly forward to near the first eye as in fig. 4 c, completing the distributor.

The type of tubing used on the distributor, to hold the radium capsules, varies somewhat with the size of the capsules and of the uterine cavity. When slender platinum 25 mg. capsules are to be used in a small cavity, Dakin tubing is convenient. If the larger brass and silver 25 mg. capsules are to be used or even the slender platinum capsules in a large uterine cavity, the closed end cot-tubing furnished for radium work is preferable. It comes in two sizes but the smaller size can be stretched to accommodate most any radium package used here. The selected tubing is stitched securely to the end of the distributor, the stitches passing through the eye. As each radium unit is slipped into place, the inner side of the tubing is stitched to the wire by passing the needle as shown in h. After this stitch is tied, a loop is taken around the tubing and tied, which holds the radium securely in place. After the radium is tied in place, any projecting corners of the tubing are trimmed off.

illustrates the use of different lengths of distributor in different sized cavities.

Movement in the other plane is controlled by the loop of wire which extends outward beside the cervix at the vaginal vault. The vaginal packing is adjusted behind and in front of this loop handle to hold it in the desired position which in turn keeps the radium capsule in the desired area, if the proper curve has been given to the distributor before introduction.

Figure 7 shows the distribution of the supplementary capsules to the cornua in a patient with corpus cancer. The patient was so stout that we almost missed getting a picture with the ordinary exposure. Figure 8 shows the distribution in another patient. Here the supplementary 25 mg. capsules are much smaller because they are screened with platinum. Figure 9 is a lateral view showing

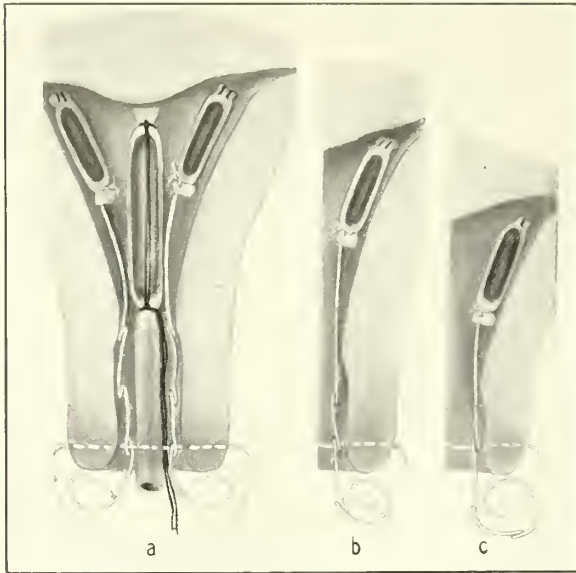


Fig. 6. Adjustment of distributor to different sized uterine cavities. If the cavity is  $3\frac{1}{2}$  inches or more, the full length of the distributor is to be used, the suture being passed through the first (lowest) eye. The loaded distributor is pushed gently in until it comes against the top wall of the cavity. In the deeper cavity, the suture is passed a little higher in the cervix. When arranging the distributor for use in shorter cavities, it is well to bend around the part which will be outside the cervix as shown in b and c. This bending should be done before the distributor is introduced as any forcible manipulation after its introduction is to be avoided.

If conization of the cervix for chronic cervicitis is to be made after measurement of the cavity, an allowance of about half an inch is to be made for the shortening of the cavity. The loaded distributors should be well lubricated with vaseline and the cervix should be re-dilated immediately preceding the introduction.

good alignment of the three capsules in the transverse plane.

Figure 10 indicates the different types of cavities with which one has to deal. The Y-shaped cavity is not infrequent, as shown by Sampson's experiments, and it has a definite bearing on the problem of radium distribution. Also, the cavity may be irregular from distortion by myoma or from carcinomatous ulceration. The depth of the cavity and its general shape are determined in the preliminary exploration. If one horn is deeper, a longer length of distributor may be used on that side. Again, the probable location of the pathological process may be indicated by the irregularity at some area or by the larger amount of soft tissue obtained there. If so, an extra capsule may be placed in the distributor of that side. Figure 11 shows the film from such a case. Figure 12 is a lateral view. It shows good alignment of the five capsules in the transverse plane.

Any manipulation within the uterine cavity must of course be conducted with extreme care and radium implantation is no exception to the rule. The number of accidental perforations of the uterine wall which have happened in simple curettage, constitute sufficient warning of that possibility whenever the uterine cavity is invaded. Consequently, radium in any form must be introduced with care



Fig. 7. Use of the distributors in a patient with corpus cancer. The patient was so stout that a picture was almost missed with the ordinary exposure. In the center is the tandem, which is low, but the cornual capsules are in good position in each horn. The rubber tubing of the tandem extends down through the cervix between the distributors but being of black rubber it does not show in the roentgen ray film.

to keep in the free cavity and to avoid any force that might injure the wall.

Figure 13 indicates the method of introducing and fastening the distributor. It is first grasped about the middle with a strong Kelly forceps and introduced part way as shown in the illustration. Then the middle hold is released and the loop handle is

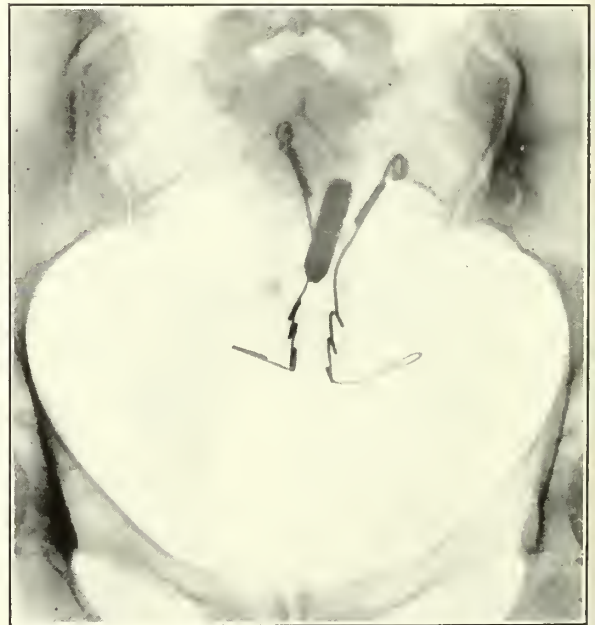


Fig. 8. The distributors in another patient. Here the supplementary 25 mg. capsules are much smaller because they are screened with platinum.





Fig. 9. Lateral view from the patient's right side in the same case as figure 8. This shows good alignment of the three capsules in the transverse plane.

grasped with the forceps and the introduction completed. When the distributor is in place in the uterus, the forceps is left on and is held firmly by an assistant so that there shall be no up or down movement while the other distributor and the tandem are being introduced. The ordinary long uterine dressing forceps is likely to be too rickety and unreliable for this purpose, a Kelly forceps being preferable. Another point is to make good re-dilation of the cervical canal immediately before beginning the introduction of the radium. Also, each package should be well lubricated with vaseline to facilitate passage through the cervical canal.

After the introduction of the second distributor and the tandem, the assistants continue their firm forceps-hold on the distributors as the suture is being passed through the cervix and distributor eyes, and also until the vaginal packing is in place behind and in front of the cervix and extending some

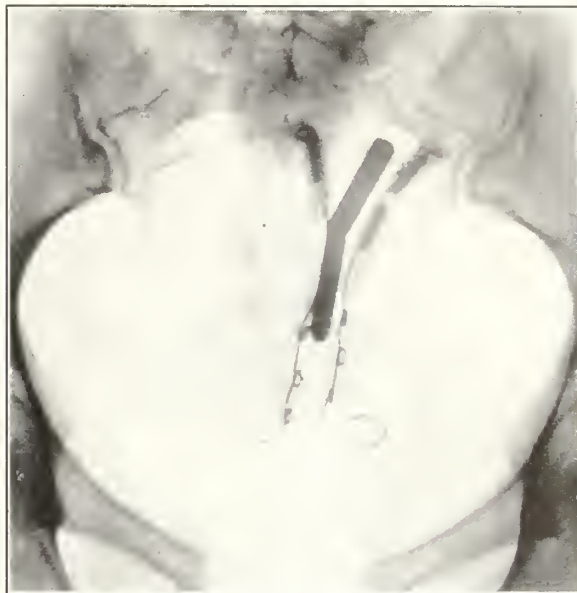


Fig. 11. A film from a patient showing a five unit distribution. In this case the right horn of the uterus was somewhat shallow and the medium length of distributor was used on this side. The other horn was longer taking the full length of the distributor. Also, more soft tissue was obtained with the curet in that side so an extra radium capsule was placed there. The center of the uterine cavity being long, a two capsule tandem was used giving five centers of radiation.

distance below the distributor handles. Then the forceps are removed and the long suture is tied over the vaginal packing.

To determine if the distributors are bent to the right curve before introduction, press the two against the tandem as they will be in the cervix after introduction. The tips of the distributors should be an inch and a half or two inches apart,



Fig. 12. Lateral view from the patient's right side in the same case as figure 11. It shows good alignment of the five capsules in the transverse plane.

Variations in Shape  
of Uterine Cavity

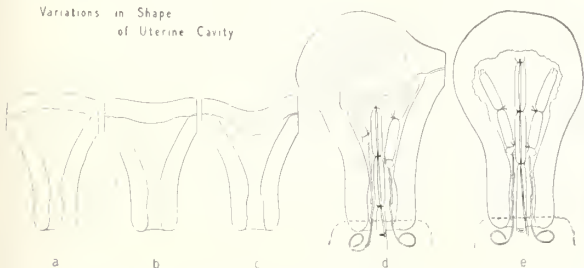


Fig. 10. Indicating the different types of cavities with which one has to deal. The Y-shaped cavity is not infrequent and it has a definite bearing on the problem of radium distribution, as shown by Sampson's experiments. a. The ordinary shape of cavity. b. The slightly Y-shaped cavity. c. The markedly Y-shaped cavity. d. Distortion of the cavity by myoma may make advisable irregular distribution of the radium as here indicated. e. Enlargement of the cavity by carcinomatous ulceration would indicate wide distribution of the radium as shown.

Introducing and Fastening the Wire Distributor

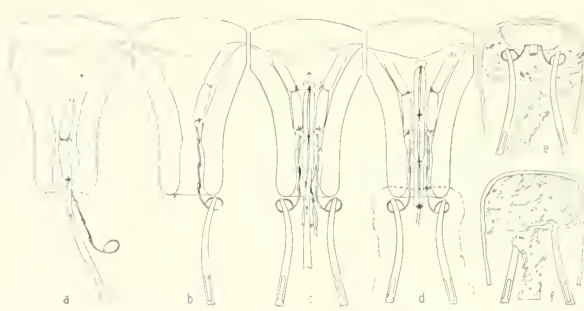


Fig. 13. Details of the introduction and fastening of the distributor as explained in the text. a. The distributor is grasped about the middle with a strong Kelly forceps and introduced through the dilated cervix as shown. b. The distributor is in place and held firmly by an assistant with the Kelly forceps clamped on the handle. c. The two distributors in place and held by forceps while the tandem is being introduced between them. The firm forceps hold on the distributors is maintained until the suture, which passes through the cervix and an eye of each distributor and the tandem tubing, is in place as in d, and also until the vaseline gauze packing is in place back of the cervix (e) and in front of the cervix and extends down beyond the distributor handles as in f. The forceps are then removed and the long suture is tied over the packing.

depending on the size of the uterine cavity as ascertained in the preliminary exploration. The spread should be somewhat more than the probable width of the top of the cavity. The size of wire used permits some spring action to hold the capsule against the lateral wall without undue pressure.

The radium capsules are to be placed on the outer side of the wire and are held in that position by the first stitch fastening the wire securely to the inner side of the tubing, as indicated in figure 5. The thread is then tied around the tubing below the capsule. The same kind of a stitch is taken at the lower end of the tubing to hold the second capsule in place.

Dakin tubing is convenient to use on the distributors in a small uterus when employing the small 25 mg. platinum capsule. However, I found that in the large uterus this small tubing did not fill the lateral area and there was a tendency of the tandem to override it laterally, in which case the larger thin walled cot-tubing, furnished for radium work, is preferable. Also, this cot-tubing will receive large units as well as small ones.



Fig. 14. Fastening the radium package securely in the uterus by a method which permits easy removal with little disturbance to the patient. a. Passing the suture through the cervix and the rubber tubing. b. Suture passed and ends left long and brought outside. The end of the gauze packing is tied to the radium string. c. The packing in place and the suture tied over the packing. This is the only knot in the suture. This arrangement holds the packing in place and also permits easy removal later.<sup>4</sup> (Crossen, Operative Gynecology.)



Fig. 15. Removal of the radium. The details of removal are: hypodermic of morphine and hyoscin one hour before, patient placed cross-bed, labia well separated to expose vaginal opening and packing, end of suture grasped and knot identified, scissors point slipped under suture as in a and suture divided and removed by steady pull. If the packing is small and hence high, a speculum or retractor may aid in exposing it. When the suture is divided and withdrawn everything is released. The released packing is then removed as in b and that brings down the radium string, which has been tied to the end of the packing as indicated in c, and a steady pull on the string delivers the tandem. Distributors are removed last, the handles being identified by touch and then grasped by forceps for removal.<sup>4</sup> (Crossen, Operative Gynecology.)

It may be well to say a word about the special suture employed to hold the radium and vaginal packing in place. This form of suture is one I have been using for several years, to hold the radium tandem in place in both myoma cases and carcinoma cases. As shown in figure 14, it passes through one side of the cervix, through the rubber tubing and out through the other side of the cervix. When supplementary capsules are used, the suture passes also through an eye of each distributor. Both ends of the suture are left long to be tied over the vaginal packing when that is in place. This tie over the packing near the vaginal entrance is the only knot in the suture.

This suture holds the radium packages securely against slipping up or down, holds the vaginal packing in place and its easy cutting (fig. 15) and extraction facilitates easy removal of the radium. This last item is much appreciated by assistants who must remove radium at various hours of day and night. This form of suture obviates the necessity of exposing the cervix and searching for a suture tied there, which is a troublesome affair, especially with the sensitive postoperative conditions. The only knot in this easy removal suture is the one near the vaginal outlet. Hence, when the suture is cut there it is easily pulled out, releasing

OPERABLE CASES OF CORPUS CANCER

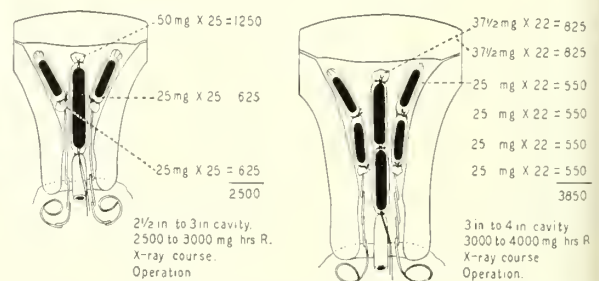


Fig. 16. Distribution of radium and the unit dosages in operable cases of corpus cancer. a. A small uterus with three unit distribution. b. A large uterus with six unit distribution.



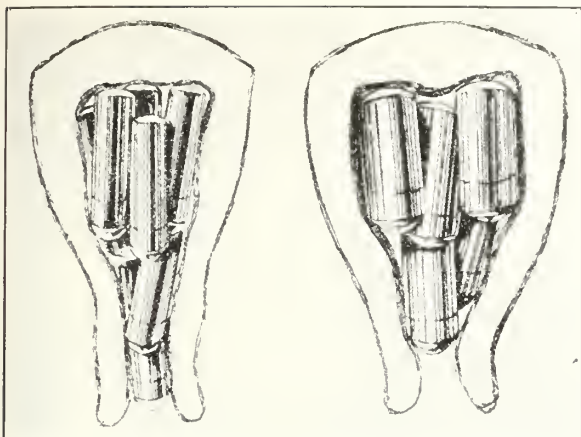


Fig. 17. An illustration from Heyman's<sup>3</sup> article describing his method of packing radium into the uterine cavity in the treatment of corpus cancer. It depicts two uterine cavities packed with radium cylinders or "buckets" as he designates them. (Heyman in *Acta Radiologica*.)

the packing and the radium. It was found that a suture tied over well-saturated vaseline gauze tends to sink into it and that a small square of dry gauze placed in front of the vaseline packing facilitates identification and removal of the suture.

This method of distribution by tandem and supplementary capsules is suitable for all radium dosages required in the preoperative radiation of corpus cancer, and being adaptable to the usual hospital radium supply it provides a practical method of widely extending this benefit to this class of patients. The preoperative radium dose varies somewhat with the size of the uterus as indicated in figure 16 and also with other conditions present in the particular case. Notice that for the large doses the tandem also is made up of divided units so as to avoid undue concentration at any one area. The reduction of the tandem units to  $37\frac{1}{2}$  or 25 mg. is easily made when the 50 mg. unit is a shell containing  $12\frac{1}{2}$  mg. needles, by wrapping two or three needles as desired in lead sheeting to give the required screening. Thus, by using only two needles for each unit a slender tandem may be made for use when the cervix cannot be dilated sufficiently for the thicker tandem. Notice that with the distribution in b, the total dose could be run considerably higher if desired without approaching the unit dosage likely to cause point devitalization of the wall.

#### PACKING METHOD OF DISTRIBUTION

In the inoperable cases of corpus cancer, where dependence must be placed wholly on radiation and it is therefore necessary to push the radium dosage to the limit of safety, it is advisable to distribute the radium still further. This is accomplished by using a large number of small capsules, preferably of uniform strength, the number of which may be a dozen or more. This serves the double purpose of giving more even distribution of the heavy radiation throughout the pelvis and of preventing spot



Fig. 18. A removed uterus packed with metal pieces of the approximate size of the French type platinum iridium 10 mg. and 15 mg. radium capsules, each dummy capsule being arranged as usual in a short length of rubber tubing tied at each end and with a long thread extending out of the cervix. Nine capsules were all that could be packed into this  $3\frac{1}{4}$  inch uterine cavity. The cavity is outlined by 50 per cent sodium iodide solution. It will be noticed that the tied ends of the pieces of rubber tubing about each capsule keep the capsules some distance away from the top of the cavity. The disadvantages of the projecting upper tied ends may be eliminated by using the closed end rubber cots if they are available in such slender size. Also, the suggestion that the medium dense metals, such as copper or steel, are more effective in cutting out secondary rays has a bearing in this connection. A coating of suitable metal over the platinum capsule would eliminate the need for rubber and would require simply the attachment of the safety thread to the eye of the capsule.

devitalization of the uterine wall by undue concentration at some point. These small radium containers are packed into the endometrial cavity until it is filled. Each small unit of course has screening equivalent to 0.5 mm. of platinum, and is encased in rubber tubing or light metal to cut out the secondary rays from the platinum screening.

The packing method of intrauterine radium distribution is that used by Heyman<sup>3</sup> of Stockholm and hence often is referred to as the Radiumhemmet or Stockholm method. Figure 17 is from Heyman's article describing the method. It depicts two uterine cavities packed with radium containing cylinders or "buckets."

Figure 18 is from some experimental work I carried out, as explained later, in testing different methods of packing radium into the uterus. It is a roentgenogram of a removed uterus packed with metal pieces approximating the length and thick-

ness of the French type platinum iridium 10 mg. radium capsules. Each dummy capsule is in a short piece of rubber tubing, tied at each end and with the usual long thread extending out of the cervix.

The packing of the uterine cavity with numerous small radium capsules may appear at first glance to be a simple matter but there are special points to be considered. In the first place, it is necessary to have the numerous small radium capsules. As previously explained, in most hospitals the limited radium supply is arranged in one or two large capsules, two to four small capsules and several needles. There is not a large number of small capsules and consequently when the packing method is used some outside radium supply must be drawn on. However, such outside supply usually is available.

Having arranged for the necessary number of small capsules, the next item is to provide for satisfactory placement of the capsules and for their certain removal. The problem is to maintain some secure outside connection with each capsule introduced, without blocking the cervical canal with strings or wires sufficiently to interfere with the introduction of following capsules. Strong thread is used commonly. The short piece of rubber tubing enclosing each small capsule is tied securely at each end with a strong thread and the thread is left long and brought out of the cervix.

In removing the radium thus packed in, it is of course necessary to remove the lower capsules first, and so on in inverse order of the packing. To do this it is necessary to distinguish the threads of the lower and higher capsules in some way. This may

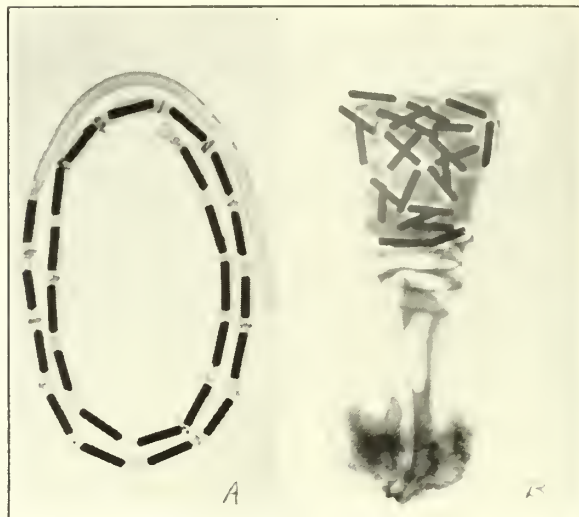


Fig. 20. Packing the uterine cavity with tubing containing shorter capsules which would be ideal for this work. a. An 18 inch length of the tubing containing twenty-five metal pieces 10 mm. long and 2 mm. in diameter representing radium capsules of that size. b. The filled tubing packed into the uterine cavity. These shorter capsules packed in easily and came out easily. Even without the cross ties for even spacing, they packed in fairly well but the distribution was not so good as when they were spaced by the cross ties.

be done by differences in color, by numbered tags or by a combination of the two.

Another item requiring special consideration in the packing method is the certain removal of the numerous small capsules. Provision must be made for absolute security against a capsule being left. There have been several serious accidents with radium capsules in various situations. In one reported case ten small capsules were placed in the uterus and all were removed, supposedly. But later developments, brought out in court, indicated that an overlooked radium capsule ulcerated through the uterine wall into the peritoneal cavity and later into the intestine and eventually caused death of the patient.

In the discussion of the subject following this paper, I remarked incidentally that in order to get away from the numerous detached small radium units I had been experimenting with such capsules threaded into a long piece of slender rubber tubing but had not reached definite conclusions. This experimental work was continued later with metal pieces approximating the length and thickness of 10 mg. platinum iridium capsules which were threaded into small tubing of Dakin-tube size and also of a size smaller. The loaded tubing was packed into the cavities of uteri secured at autopsies to observe how readily it could be packed in and removed. The distribution was determined by closing the cervix, injecting the cavity with 50 per cent sodium iodide solution and then taking a roentgen ray film.

Two sizes of 10 mg. platinum iridium radium capsules with 0.5 mm. platinum screening are available. The French type is 21.7 mm. long and 2.65 mm. in

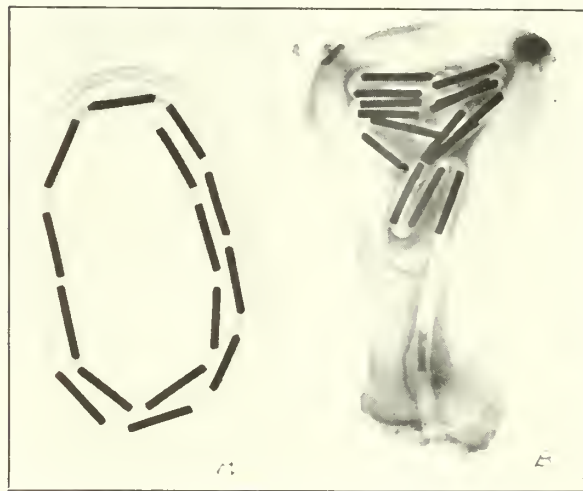


Fig. 19. Packing the uterine cavity with the small size (15 by 2 mm.) capsules contained in a long piece of rubber tubing. a. The slender tubing (a size smaller than Dakin tubing) containing fifteen metal pieces representing 10 mg. radium capsules 15 mm. long and 2 mm. in diameter. b. The filled tubing packed into a uterine cavity  $3\frac{1}{4}$  inches deep and with cervix well dilated. The increase in the apparent length of the cervix is due to infolding by the extensive suturing necessary to hold in the sodium solution. The roentgenogram shows fairly good distribution of the capsules. The air spaces at the ends of the capsules outline folds of the slender tubing. In the cervix, some of the iodide solution has gotten into the lumen of the tubing filling it for a short distance.



diameter, while the other type is 15 mm. long and 2 mm. in diameter. The smaller size, threaded into slender tubing and evenly spaced by ties between the capsules, was found to pack into a medium sized uterine cavity well and to come out without difficulty. The cervix should of course be well dilated. The French type of 10 mg. capsule, being longer, did not pack in well and it presented serious difficulty in removal on account of the length. Although the added length is only from 7 to 8 mm., it is like the proverbial small addition to the end of a nose, it makes a big difference.

The metal pieces representing the small size 10 mg. radium capsules are shown threaded into slender rubber tubing in figure 19a and the filled tubing packed into the uterine cavity is shown in figure 19b. This uterine cavity is  $3\frac{1}{4}$  inches deep and the cervix could be easily dilated to  $\frac{3}{4}$  of an inch. The roentgenogram shows fairly good distribution of the capsules.

If a shorter radium capsule, for example about 10 mm. long by 2 mm. in diameter, were available, it would be ideal for this continuous tube packing. Figure 20a shows metal pieces of this size threaded into tubing and figure 20b shows the filled tubing packed into the uterine cavity. This filled tubing packed in easily and came out easily. Even without the cross ties it packed in fairly well, but the distribution was not so good as when there was even spacing by cross ties. As to be expected, the uniformity of distribution improves with the increase in the number of radium units which can be packed into a cavity. The empty portion of the tubing may be used to push the filled part well up in the cavity as shown.

If such short radium capsules were available, their use in tubing as here suggested would simplify the radium treatment of inoperable cases of corpus cancer. However, such small 10 mg. or 5 mg. radium capsules are not cataloged at present and even the 15 mm. length capsules, which are made, are not in the ordinary hospital radium supply in sufficient quantity to be used for this purpose. Consequently, the packing method of radium distribution will continue to be carried out largely by the use of separate units with a thread attached to each, with the extensive tying and radium handling which that entails.

Reverting to the wire distributor, devised for giving good distribution for operable cases with the containers of the ordinary radium supply, I found that it could be used to give also the dosage required in the inoperable cases. Figure 21A shows a seven unit distribution in a rather large uterine cavity. This will permit the required heavy dosage, provided the tandem units are reduced to uniform strength with the lateral units, which can be done easily when the large units are shells containing needles.

For example, at Barnes Hospital the larger units are shells containing  $12\frac{1}{2}$  mg. needles of monel metal, there being altogether eight such needles.

There are also three small 25 mg. capsules with adequate screening (0.5 mm. platinum). The seven unit distribution shown in figure 21A represents four pairs of the  $12\frac{1}{2}$  mg. needles, each pair wrapped in lead sheeting for the required additional screening, and the three 25 mg. capsules. With this systematic distribution of units of uniform strength, the needed dosage may be given without the radiation from any one unit approaching the point devitalization limit.

The monel metal needles have little screening and the necessary wrapping with lead to the 0.5 platinum equivalent makes thick packages, as shown in the film. Only a rather large uterine cavity with well dilated cervix would receive these. Platinum needles of 10 mg. strength and 0.5 platinum screening may be obtained from a private rental supply and, being smaller, they permit the seven unit distribution in a small uterus. In a still larger uterus, a nine unit or eleven unit distribution may be made by fastening one or two additional small units to the inner side of each distributor in a separate piece of small tubing. Figure 21B shows an eleven unit distribution of this type.

In the inoperable case with a small uterus, the required radium radiation of the uterus and adjacent tissues may be made by utilizing the cervix as well as the corpus cavity. Figure 21C shows a six unit distribution in a senile uterus with a cavity  $2\frac{1}{2}$  inches deep and a correspondingly small width. Such distribution of five or six units of uniform strength permits adequate dosage for the small uterus the cervix of which can be well dilated.

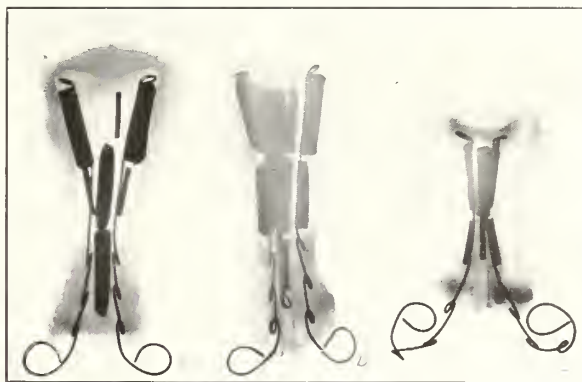


Fig. 21. A. A seven unit distribution with the distributors, using metal pieces representing four pairs of  $12\frac{1}{2}$  mg. radium needles of monel metal and three 25 mg. radium capsules of platinum. Each pair of monel metal needles is wrapped in lead sheeting to give the required screening. This number of such large packages could be used only in a rather large uterus. Where additional platinum capsules or needles can be obtained, they are preferable. Being smaller, they are more easily placed and also permit of nine unit and eleven unit distribution in large uteri. B. An eleven unit distribution with the distributors. For such extensive distribution it is advisable to use the slender platinum containers throughout, although in a large uterus with well dilated cervix the tandem may contain wrapped monel metal needles as shown. This thick tandem obscures some of the supplementary units attached to the inner side of the distributors. C. The small senile uterus of the inoperable corpus cancer case has such a small endometrial cavity that it presents a problem in distribution by any method. However, if the cervix can be well dilated it also may be utilized by using the distributors as shown in this six unit distribution or by extending detached unit packing into the dilated cervix.

There are then three methods which may be used for providing the additional number of intrauterine radiation centers advisable for the heavy dosage needed in inoperable cases; namely, the usual method of packing with detached small units with a thread attached to each, packing with the small units threaded into a single long piece of slender rubber tubing and the use of the wire distributor for systematic distribution of units of uniform strength. Each method has its advantages and disadvantages, as already explained, and the one to be preferred depends on the local conditions present in the particular case and the radium supply available.

In inoperable cases of corpus cancer, repeated intrauterine radiation sometimes may be advisable. For example, if after the usual radium and roentgen ray radiation there is recurrence of bleeding or other evidence of intrauterine activity, and the patient is still too seriously handicapped for operation, another curettage and intrauterine radium treatment are indicated. In fact, some have suggested diagnostic curettage after some months even if there are no symptoms to determine certainly whether or not there is recrudescence of carcinoma activity, and if so to give additional radium treatment. This diagnostic curettage after some months would seem to be especially indicated in any case in which the primary dose had been only moderate for any reason.

In all corpus cancer cases it ordinarily is advisable to supplement the intrauterine radium treatment with deep roentgen ray therapy so as to give every possible chance of devitalization of cancer cells throughout the pelvis.

#### CONCLUSIONS

1. In cancer of the corpus uteri preoperative radiation is advisable to lessen the risk of fatal peritonitis by eliminating the infective discharge in the bleeding uterus and to diminish the chance of implantation metastasis by cancer cell devitalization.

2. Intrauterine radium treatment is the most important feature of this preoperative radiation, although roentgen ray radiation also usually is advisable as an aid toward extrauterine cancer cell devitalization.

3. Distribution of the radium in several centers is advisable but satisfactory distribution has proved difficult. A special wire distributor is presented which enables good distribution for preoperative radium treatment with the usual hospital radium supply. Details of making the distributor are shown in figures 4 and 5. Points in its use and films of patients are shown in figures 6 to 16.

4. In the inoperable cases, the larger dosage required necessitates more extensive distribution, particularly in the larger uteri. To accomplish this there are three methods: packing the cavity with detached small units, packing the cavity with the small units threaded into a long piece of slender rubber tubing and using the wire distributor to

make systematic distribution of the required number of units.

5. The choice of the method of distribution in the inoperable case depends on the local conditions in that case and the available radium supply. If there are available eight to twelve of the slender platinum 10 mg. or 15 mg. radium capsules of the 21 or 22 mm. length, packing with detached capsules, as shown in figure 18, would be most convenient. If a sufficient number of the 15 mm. length capsules are available and particularly if 10 mm. capsules should be made, the packing-in and removal of the radium would be much simplified and better distribution secured by threading the small capsules into a single piece of slender tubing and packing this into the cavity as shown in figures 19 and 20. If the radium supply is limited and it is necessary to use various types of units, the wire distributor sometimes may be used to make advantageous distribution of the different units as shown in figure 21.

University Club Building.

#### BIBLIOGRAPHY

1. Schmitz, H.: *Am. J. Obst. & Gynec.* **25**:10 (January) 1933.
2. Sampson: *Am. J. Obst. & Gynec.* **28**:783, 1934.
3. Heyman, J.: *Acta Radiol.* **16**:129, 1935.

## OXYURIASIS AND APPENDICITIS

### AN UNUSUAL CASE

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AND

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The main purpose of this paper is to describe an unusual case of appendicitis with oxyurids, unusual because of the enormous size of the appendix and the countless number of oxyurids found in the lumen. Figure 1 shows well the size, both length and circumference, of the appendix. It is well known that it is a frequent occurrence to find these parasites in appendices but not of these proportions. Margaret Warwick<sup>1</sup> states that oxyurids were found in forty-five cases or 1.9 per cent of 2,344 appendices examined. She further states that forty-three of the forty-five cases occurred in females. The average age was 18 years. She further states that the symptoms noted such as history of recurrent attacks of abdominal pain, acute attacks of pain and the history of steady pain for long periods clearly indicate that differentiation of the two conditions is almost impossible. This last opinion is borne out by Harry G. Sloan<sup>2</sup> who states that he knows of no way of differentiation unless it is the increase of the eosinophiles in the differential count. Brayton H. Ransom<sup>3</sup> mentions that in some European cities oxyurids were found in from 10 to 42 per cent of the appendices while in Paris they were found in only 4 per cent. From the literature



reviewed the symptoms of the two conditions are much the same.

#### REPORT OF CASE

M. B., female, aged 12 years, was seen March 30, 1940, at noon. Her complaints were pain in the right side and nausea. The present illness started the previous morning when the patient awakened nauseated and with a pain across and through the lower abdomen. The pain was dull in character and lasted all day until late in the evening when all the pain seemed to be in the right side low down. She was nauseated throughout the day and vomited several times. She was unable to take any foods. She had fever during the day and night. On the morning of March 30 the pain was in the right side, she was nauseated but had not vomited since the previous day. She did not sleep well during the night. She still had some fever and the right side was sore when she walked or moved about. No laxatives had been given but she was given an enema late the previous day with some apparent relief.

The past history was negative except the patient had had two similar attacks but less severe. With each attack she was nauseated and vomited, had pain through the abdomen and in the right side and had fever.

The physical findings were normal except that there was some tenderness in the right lower quadrant with definite muscle spasm.

The following blood picture was obtained: hemoglobin, 85 per cent, 13 gms.; erythrocytes 4,360,000; leukocytes, 23,250; polymorphonuclears, 92; immature, polymorphonuclears 13; lymphocytes, 8; basophiles, eosinophiles and other cells, 0; nuclear index, 6.1; color index, 0.98; resistance index, 9; cells normal as to color, shape and size. Urine was normal. Wassermann was negative.

The appendix was removed through a right rectus incision. It was noted that the appendix had a short mesentery. Grossly the appendix was large and long. The blood vessels on the surface were injected. The whole appendix was red and there were three or four gangrenous areas over the middle and distal thirds of the appendix.

Numerous pinworms were seen in the lumen of the specimen. Microscopically a marked acute inflammatory process was seen. There were also chronic changes showing lymphoid hyperplasia, some scarring and glandular overgrowth. Diagnosis was acute gangrenous appendicitis with oxyurids superimposed upon a chronic appendix.

The patient made an uneventful recovery and is now doing well.

It is believed possible that this patient did have two similar attacks in the two preceding years and

that it was fortunate the appendix was removed when it was.

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#### BIBLIOGRAPHY

1. Warwick, Margaret: The Relationship Between Oxyuriasis and Appendicitis, *Am. J. Clin. Path.* 5:238 (May) 1935.
2. Sloan, Harry G.: Appendicitis, in Lewis, Dean: *Practice of Surgery*, Hagerstown, Md., W. F. Prior Company, Inc., vol. 7, chap. 3, p. 14.
3. Ransom, Brayton H.: The Metazoan Parasites of Man, cited in Nelson Loose-Leaf Living Medicine, New York, Thomas Nelson & Sons, vol. 2, chap. 1, p. 416-417.

## THE NONOPERATIVE TREATMENT OF HEAD INJURIES

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The frequency of craniocerebral injuries, in which no major operative procedure is indicated, seems to justify a brief discussion of their management. Since most of the patients with such injuries are hospitalized, the following comments are applicable to treatment in such institutions.

An individual who has experienced a craniocerebral injury first should be put to bed with as little commotion and moving about of the patient as possible. If he is having hemorrhage from any part of his body this should be controlled immediately. Shock, if present, next should be combatted by the usual methods, i. e., the use of stimulants, lowering the head of the bed, intravenous solutions, application of warmth and blood transfusion. Although this discussion is limited primarily to non-operative cases, it is worth while mentioning that if a scalp laceration is present, inspection, and particularly palpation of the depth of the wound with the scrubbed or gloved finger, is not only a valuable procedure but one which is indicated. The diagnosis of a compound fracture thus is established easily and the presence or absence of foreign bodies determined.

A complete general physical and neurological examination should be made as early as the condition of the patient will permit with particular care being given to a search for fractures and visceral injury. Not infrequently one is puzzled as to why an apparently mild cerebral injury results in persisting shock only to find at autopsy that some viscera has been ruptured with a resultant secondary hemorrhage, the latter being masked by the stupor due to the cerebral injury.

In many hospitals of good repute every head injury is sent to the radiology department for skull plates before being admitted to a hospital bed. No doubt an occasional fracture line crossing an important vascular channel is demonstrated with the result that a more careful watch is kept of the patient for possible delayed intracranial hemorrhage. Also, the medico-legal aspect is cared for since, on a busy service when skull plates are postponed for several days, some patients may be dismissed without roent-



Fig. 1. Size of removed appendix.

genological studies having been made. It is my feeling that skull plates may be delayed except in cases of compound skull fracture, depressed skull fracture and suspected middle meningeal hemorrhage. In order to protect one's self and the institution in case legal proceedings are instituted at a later date, it seems advisable to have roentgen rays of the skull made on all patients with head injuries before they are discharged.

Recording of the pulse and respiratory rates and blood pressure readings is a valuable aid in the treatment of cerebral injuries and it seems fitting to mention the rather infrequent alteration in the blood pressure even though the pulse and respiration slows and becomes irregular as a result of massive intracranial hemorrhage. Time and again one sees a relatively stable pressure with marked changes in the other two signs and in the patient's general condition. Often the differentiation between brain stem injury and extracerebral hemorrhage must be made and the earlier rise in the pulse and respiratory rate from the brain stem injury is often of diagnostic import. It is not necessary to discuss the well recognized sign of a slowed pulse rate and slowing of respirations with irregular breathing that so often is indicative of extracerebral bleeding.

Spinal puncture of necessity must be considered in the discussion. One can use spinal puncture for three different purposes in handling head injuries: (1) to determine the pressure of the fluid in the spinal subarachnoid space, (2) to obtain information concerning the condition of the fluid, and (3) for treatment by reduction of intracranial pressure by removal of some of the fluid. I feel that early lumbar puncture may be employed safely for diagnostic purposes in head injuries with the exception of those in which an extradural hemorrhage is likely and in this latter group the appearance of the fluid often will enable one to differentiate sufficiently between an extradural hemorrhage and a lacerated brain to withhold operation. Whether or not one treats head injuries with repeated spinal punctures probably will depend on his ideas regarding the physiology of intracranial fluids. If he believes that congestion of cerebral vessels is lessened and edema subsequently diminished more rapidly following the withdrawal of spinal fluid, repeated punctures are in order. On the other hand, if he feels that removal of spinal fluid must be followed by venous and capillary engorgement, he will probably resort to dehydration therapy. Sucrose and sorbitol have of course been advocated as superior to 50 per cent glucose because they are not utilized by body tissues and are excreted unchanged along with fluids withdrawn from edematous tissues. I have observed no definite advantage in dehydration with sucrose or sorbitol over that obtained with glucose, nor has there been any obvious clinical change in my cases to suggest more frequent edema following the use of glucose than

the other solutions. When a patient with a head injury requires dehydration and has few or no accessible veins,  $MgSO_4$  by stomach tube is a valuable aid. I have used salyrgan (1.0 cc.) in conjunction with intravenous glucose (50 per cent) and feel that the urinary output is considerably increased. Observations on this combination are too few to permit any definite conclusions as regards the lessening of cerebral edema.

Many neurosurgeons feel that too much emphasis has been placed on increased intracranial pressure and its treatment in the care of head injuries. Obviously, every individual who sustains a head injury does not require therapy directed toward a reduction of intracranial pressure since such an elevation of intracranial pressure is not necessarily present. There are many patients with evidence of an elevated pressure who seem to be in good condition and it is in the care of these individuals that the question of therapy may be debated. Suffice it to say that an increase of intracranial pressure, particularly a rapid increase, produces venous congestion which in turn results in edema, and since nerve cells are particularly susceptible to anoxemia it seems quite rational to prevent the anoxemia secondary to cerebral congestion and edema. The use of oxygen inhalations by means of a mask giving a high concentration of the gas also seems in order.

Hyperthermia is a relatively common finding in severe brain injuries and is an extremely difficult complication to treat. As far as is known the rapid and marked rise in temperature is associated with changes (edema and hemorrhage or hemorrhage) in the region of the hypothalamus. In addition to a high temperature, a patient so afflicted usually has cold and mottled extremities, a rapid, weak pulse and rapid respirations. Treatment consists of an attempt to improve peripheral circulation and to decrease body temperature. The common procedure is the application of alcohol or ice packs to the patient's body and limbs. It seems more rational to attempt to improve peripheral blood flow by the use of massage and tepid sponges, thus bringing blood to the skin where heat loss may then be hastened by cold spongings and the use of the electric fan. Cool or ice enemas even are permissible at times and are effective. The use of blood transfusions also has been employed with the idea of producing peripheral dilatation and loss of heat by a more adequate circulation.

Too often the simple procedure of catheterization is overlooked and a patient with a full bladder tosses about and undoubtedly increases venous (cerebral) congestion because of vesical discomfort which a semicomatose state does not permit him to care for adequately. Of course, for those patients who remain comatose for lengthy periods some type of bladder drainage, which will minimize infection, should be instituted.

Another point in the care of these patients that seems important is the position of the individual in



bed. Since the big problem in so many cerebral injuries is one of edema it has always seemed a rational step to elevate moderately the patient's head, his general condition permitting. A pillow or two or slight elevation of the back rest should suffice. Also it seems worth while to place the individual's head, if he is not too restless, so that there is a minimum of compression of the large veins of his neck. Changing the position of the patient in bed several times daily is also of value in preventing pulmonary and skin complications.

One must do what he can for the patient who remains just below a conscious level and who is on the verge of some pulmonary complication. It seems justifiable to stimulate such a patient strongly with such drugs as strychnine, caffeine and benzedrine in the hopes of rousing him sufficiently to prevent a fatal pulmonary lesion.

In considering types of sedation, one may comment briefly that morphine should not be used except when necessary to control severe pain from trauma elsewhere and that the barbiturates and codeine are much safer. Chloral hydrate and paraldehyde are also quite valuable.

Sulfanilamide, sulfapyridine and sulfathiazole have worked such miracles that their use well may be given considerable thought in treating patients with spinal fluid leaks. They cannot be used indiscriminately, obviously, but the early use of one or the other may save a patient from a fulminating meningitis.

An adequate period of bed rest tends to lessen the so-called post-traumatic syndrome. Two weeks of bed rest is generally the minimum and a longer period is indicated for the individual with a severe injury.

To conclude, one finds that patients with non-operative head injuries show more improvement when they are treated by methods which utilize a few of the fundamentals of intracranial physiology and ordinary nursing care.

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#### REPORT SKIN ERUPTION CAUSED BY DUST FROM RESIN-LINED TIN CANS

Three cases of a skin eruption caused by the dust coming from resin-lined tin cans are reported in *The Journal of the American Medical Association* for August 10 by Louis Schwartz, M.D., Washington, D. C., and J. P. Russell, M.D., Sacramento, California, who believe that these are the first cases to be cited in the literature.

In trying to determine the causative agent the authors made numerous studies from which they conclude: "Since the resin coating of cans is a comparatively recent process, and since no cases of similar eruptions have been reported from tin or iron, it seems likely that this dermatitis (skin rash) was caused by sensitivity to the resin coating on the inside of the can, some of which flaked off in the form of dust. Similar cases occurred only in canneries where lacquered cans (resin-lined) were used.

"We were unable to find the exact chemical causing the eruption because we could not obtain full cooperation from the companies making the cans as to the exact composition of the lacquer."

## THE LARGE BABY

W. D. HAWKER, M.D.

ST. LOUIS

Several articles have been published recently concerning delivery of the large baby. It was pointed out in these papers that the fetal mortality rate, the necessity for operative interference and the incidence of postpartum hemorrhage were markedly increased.

A group of large babies each weighing more than 4,500 grams, born in the St. Louis City Hospital, were analyzed. During the last five years there were 8,890 deliveries at this hospital. Of this number there were 102 babies (1.1 per cent) who weighed more than 4,500 grams.

In this series the average parity of the mothers was 5.2. The average parity of the general obstetric admissions was only 3.1. The following table shows the frequency of the parity of the mothers in this series.

Table 1. Frequency of Parity

Parity	Number of Cases
1	7
2	12
3	16
4	17
5	12
6	12
7	7
8	6
9	4
10	6
11	2
12	2
13	0

The presentations of the large babies were proportionately no different from the usual presentations. However, the presentation did affect the mortality rates as illustrated in table 2. Abnormal presentations, while not encountered more frequently, were associated with greater danger to the large baby.

Table 2. Presentation and Mortality

Presentation	Cases	Per Cent	Deaths	Per Cent	Correction	Per Cent
Vertex						
Anterior	93	91.1	3	3.2	2	2.1
Posterior	4	3.9	1	24.0	0	0.0
Breech						
Full	3	2.9	2	66.6	1	33.3
Footling	1	1.0	1	100.0	1	100.0
Face	1	1.0	1	100.0	1	100.0
Total	102	99.9	8	7.8	5	4.9

The delivery of the large baby did not depart from normal except that the incidence of operative interference was somewhat higher than was found in the general delivery service. Operative interference was necessary in fifteen instances (14.7 per cent) of the vertex presentations but was not noted in the breech or face deliveries. The average operative interference on the general obstetric service was 7.2 per cent. Forceps were applied in fifteen cases. In eight deliveries episiotomies were performed. In two of these cases forceps were not ap-

plied. The Elliott forceps were most popular, being used in seven cases. Table 3 illustrates the operative interference necessary.

Table 3. Operative Interference

Presentation	Cases	Forceps	Forceps and Episiotomies	Episiotomies	Total	Per Cent
Vertex						
Anterior	93	4	6	2	12	12.9
Posterior	4	3	0	0	3	75.0
Breech						
Full	3	0	0	0	0	0.0
Footling	1	0	0	0	0	0.0
Face	1	0	0	0	0	0.0
Total	102	7	6	2	15	14.7

In correcting the mortality rates, elimination depends upon the following conditions being present: (1) active syphilis, and (2) stillbirths when the fetal heart was not heard prior to labor.

As is seen from the foregoing tables, there were eight deaths in this series, or a gross mortality rate of 7.84 per cent. Of this number three cases were excluded. The corrected fetal mortality rate for the entire group was 4.9 per cent. The mortality rates for the large breech and face babies were high (33.3 and 100 per cent). The corrected fetal mortality rate for all breech deliveries, regardless of weight, over this same five year period was only 5.84 per cent.

The intern in delivering eighty-nine cases had a corrected fetal mortality rate of 2.2 per cent as compared to the 25 per cent rate of the assistant residents. This discrepancy can be explained by the fact that the intern was relieved of the responsibility of the difficult deliveries. Table 4 illustrates the role of the obstetrician.

Table 4. Obstetrician and Mortality

Obstetrician	Cases	Deaths	Per Cent	Correction	Per Cent
Intern	89	2	2.2	2	2.2
Asst. Resident	12	5	41.6	3	25.0
Resident	1	1	100.0	0	0.0
Total	102	8	7.8	5	4.9

Among the complications of delivery, only two cases of postpartum hemorrhage (more than 500 cc.) were encountered (1.9 per cent). In one instance a manual removal of the placenta was necessary. In seven deliveries the cord was wrapped about the baby's neck. None of these babies died.

Of the 102 babies in this series 78.4 per cent were males and 21.6 per cent were females as compared to the usual secondary sex ratio of 52 per cent males and 48 per cent females. This merely emphasized the fact that males as a group have a greater birth weight than females.

Table 5. Sex, Presentation and Mortality

Sex	Vertex Ant.	Vertex Post.	Breech Full	Breech Foot	Face	Total	Per Cent	Correction for Deaths	Per Cent
Male	77	0	1	1	1	80	78.4	4	5.0
Female	16	4	2	0	0	22	21.6	1	4.5
Total	93	4	3	1	1	102	100.0	5	4.9

In this series there were ninety-four living babies. Of this number only one required resuscitation. One baby who suffered a fracture of the humerus died during delivery. In another instance Erb's palsy was noted.

In three cases induction of labor occurred. Two patients were induced with quinine and castor oil and in a third a bag was used.

There were fourteen lacerations of the perineum of which four were first degree and required no repair. Five first degree and five second degree tears required repair. There were no third degree tears. No secondary closures were necessary.

There were no maternal deaths in this series. One mother received a fracture of the coccyx during delivery.

Among the complications of pregnancy there were two cases of diabetes mellitus. Syphilis, epilepsy, dextrocardia, essential hypertension and polyhydramnios were noted also.

Because of the indefinite history obtained from so many of the mothers, no conclusions were drawn concerning the duration of the various stages of labor.

## SUMMARY

1. A series of 102 babies who weighed over 4,500 grams was analyzed. This group made up only 1.1 per cent of all the deliveries at the St. Louis City Hospital.

2. The average parity of the mothers was higher than that of the general obstetric patients admitted.

3. The distribution of the presentations remained essentially the same as the general deliveries but, where abnormal presentations were encountered, the infant mortality rates were decidedly affected.

4. Operative interference (forceps applications and episiotomies) was necessary in 14.7 per cent of the deliveries. Although this was nearly twice that of the deliveries in general, in retrospect it is felt that an even higher incidence would have lowered the mortality rates.

5. The corrected fetal mortality rate for this entire series was only 4.9 per cent. There were no maternal deaths.

6. Postpartum hemorrhage of more than 500 cc. occurred only twice, or an incidence of 1.9 per cent.

7. Of the 102 babies born 78.4 per cent were males.

8. Diabetes mellitus was noted in only two mothers in this series of 102 pregnancies.

St. Louis City Hospital.

## PANTOTHENIC ACID AND NUTRITION

Observations made by T. D. Spies, M.D., Cincinnati; S. R. Stanbery, M.A., Birmingham, Alabama; R. J. Williams, Ph.D., Austin, Texas; T. H. Jukes, Ph.D., and S. H. Babcock, Ph.D., Berkeley, California, indicate that pantothenic acid is essential to human nutrition and that its function is probably associated with that of riboflavin (vitamin B<sub>2</sub>), they report in the August 17 issue of *The Journal of the American Medical Association*. Pantothenic acid is a powerful growth-stimulating acid found in many plants and animals.



## AN EVALUATION OF THE KAHN TEST PROCEDURE IN ST. LOUIS

A PRELIMINARY REPORT OF THIRTY-ONE  
MEDICAL INSTITUTIONS

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AND

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ST. LOUIS

The St. Louis Health Division was successful in obtaining the passage of certain legislation in January 1939 which will undoubtedly lead to a new era in the control of venereal diseases in St. Louis. Briefly, this legislation provides that the treatment of venereal diseases by the Health Division be discontinued and the patients referred to one of seven cooperating hospital clinics for treatment at city expense. It became apparent immediately that it was necessary to standardize the serologic test since the situation in St. Louis was the same as prevails in most parts of the country, frequent and wide disagreement in serologic findings on split blood specimens when examined in different laboratories.

The Health Commissioner invited forty-one medical institutions to participate in a program of standardizing a serologic test in St. Louis. Then, following a preliminary conference of responsible hospital personnel, a questionnaire was sent to these institutions asking for data in regard to the kind of serologic test performed and other pertinent laboratory data.

Information obtained by these questionnaires showed that thirty-two of the forty-one medical institutions did serological tests for syphilis and the remaining nine had this work done by some outside laboratory. Table 1 shows that of the thirty-two laboratories conducting serological tests twenty-five did the Kahn test either alone or in conjunction with some other test; twenty-five laboratories did some modification of the Wassermann test in conjunction with another test; nine laboratories did the Kline test either alone or in conjunction with another test; two laboratories conducted the Eagle test in conjunction with another test and one laboratory conducted the Ide test in conjunction with another test. Furthermore, of the twenty-five laboratories that conducted the Kahn test, four did this test alone, seventeen in conjunction with the Wassermann, three in conjunction with the Wassermann and Kline and one in conjunction with the Kline test.

These findings indicated that twenty-five or 78 per cent of the thirty-two institutions conducting serologic tests for syphilis were using the Kahn test and, since this test was one of the six officially approved by the United States Public Health Service and other official groups at the Hot Springs conference in 1938, it was decided to adopt it as the standard in St. Louis.

Following the questionnaire, surveys were made of the Kahn test procedure in the twenty-five institutions doing the Kahn test and in the remaining seven after this test had been adopted. The method used in making these surveys was, essentially, a member of the Health Division Laboratory spent a day in each laboratory watching the technician conduct the test and inspecting the equipment and glassware. An outline containing pertinent information regarding facilities, reagents and technic taken from Dr. Kahn's latest publications<sup>1</sup> was used as a guide. If the facilities were found to be inadequate, the reagents not standard or the technic deviated from the author's, recommendations were made for correction.

The variation in technic found in St. Louis might also account for the wide variation found in other laboratories throughout the country as indicated in the United States Public Health Service evaluation studies. In the 1935 study<sup>2</sup> it was found that in fifteen laboratories conducting the Kahn test in various parts of the country the sensitivity ranged from 30 to 90 per cent and the specificity from 98 to 100 per cent. These wide variations were noted in subsequent evaluation studies of state laboratories.

It is apparent that the same situation existed in St. Louis among the twenty-five laboratories doing the Kahn test. The one item of technic causing the greatest variation in Kahn reports was the reading factor. Reading was done incorrectly in some of the smaller laboratories primarily because the worker would see only a few positive reactions and perhaps no partial reactions in the course of a year. Some laboratories missed positive and doubtful reactions because of not utilizing the proper light arrangement, others because of improper interpretation of the amount of precipitate present or because of dirty and badly scratched glassware.

The Kahn antigen was the next important factor causing discrepancies in St. Louis laboratories. Of some twenty Kahn antigen samples made in various laboratories and compared with standard antigen secured from Dr. Kahn, all but three samples were either more or less sensitive than the standard.

Next in importance was the manner in which sera were being heated in some laboratories. Water baths were being maintained anywhere between 54 and 58 C. However, it has been definitely proven that even one degree variation from 56 C. over a period of 30 minutes definitely influences the sensitivity of the test.

Shaking of the test materials by hand instead of using a mechanical shaker, or using a mechanical shaker of incorrect speed definitely caused variations in results.

These factors and many minor variations in technic practically have been eliminated in thirty of the thirty-one laboratories that are now doing the Kahn test. Recommendations made by the Health Division were carried out in all but one laboratory. One or more visits by the technician to the Health

From the St. Louis Health Division Laboratory.

Table 1. *Kind of Serologic Tests with the Number of St. Louis Medical Institutions Conducting Each*

Kahn & Was- ser- mann	Kline & Was- ser- mann	Kline & Was- ser- mann	Kahn & Kline	Eagle & Was- ser- mann	Eagle & Kline	Eagle & Ide	No Test	Total
17	4	4	3	1	1	1	9	41

Division Laboratory succeeded in correcting the reading technic. In only five laboratories was it necessary to recheck the Kahn technic in order to eliminate variations in results.

After the surveys were completed and satisfactory standards attained, split identical specimens were sent to these thirty-one laboratories which included twenty-three hospital, seven private clinical and the Health Division Laboratories. These sera were collected under the direction of Dr. F. C. Gillick, Chief of the Venereal Disease Service, and were sent to small groups of laboratories. Each laboratory was furnished with portions of the same batch of Kahn antigen made in the Health Division Laboratory and approved by Dr. Kahn.

Table 2 gives an analysis of twenty laboratories that were successful in securing correct results on one series of check specimens. Six of the seven laboratories that only recently had adopted the Kahn test are recorded in this table. Remarkably close agreement was obtained by the majority of these twenty laboratories. In order to evaluate the results obtained by the respective laboratories, the findings reported by the majority of these laboratories were considered as the correct Kahn report. In a few instances where the rule could not be applied and for want of a better criterion, the results obtained by the Health Division were considered correct. The specimens showing one plus differences in the final reaction are not recorded in this table since these differences are not considered as significant.

Of these twenty laboratories, six showed no significant differences from the correct report. Ten laboratories had only 1 to 2 per cent of the speci-

Table 2. *Nineteen Laboratories Approved for Kahn Test Following Examination of One Series of Check Specimens*

Laboratory No.	No. Specimens Examined	Specimens Showing +++, +++ or ++++		Specimens Showing Difference Between Positive & Negative	
		No.	Per Cent	No.	Per Cent
I <sup>1</sup>	363	0	0	0	0
II	120	0	0	0	0
III	119	2 <sup>2</sup>	1.7	2	1.7
IV	120	0	0	0	0
V	120	0	0	0	0
VI	119	1	0.8	0	0
VII	120	4	3.3	1	0.8
XI	69	1	1.4	1	1.4
XIV	68	0	0	0	0
XIX	63	0	0	0	0
XXII	87	1	1.1	1	1.1
XXIII	87	1	1.1	0	0
XXIV	87	3	3.4	1	1.1
XXV	87	1	1.1	0	0
XXVI	76	2	2.6	1	1.3
XXVIII	87	1	1.1	0	0
XXIX	87	1	1.1	1	1.1
XXX	87	1	1.1	1	1.1
XXXI	87	1	1.1	1	1.1
XXXII	86	2	2.3	2 <sup>3</sup>	2.3

1. Health Division Laboratory.

2. Nontechnical error.

3. Faulty water bath caused this error.

mens showing differences from the correct report and the remaining four laboratories had from 2 to 4 per cent showing discrepancies. When only the specimens showing discrepancies between positive and negative are considered, it was found that ten laboratories had no such specimens, eight had about 1 per cent and the remaining two had 1.6 and 2.3 per cent, respectively.

There were nine laboratories that failed to agree with the correct Kahn report on a fairly large number of specimens. As noted in table 3, these laboratories had from 3 to 15 per cent of their specimens showing differences from the correct Kahn report. Two other laboratories reported a large number of atypical reactions. These laboratories were notified that obviously something was wrong with their Kahn technic. As a result, the technician was sent to the Health Division Laboratories for further instructions. In all instances but one it was found that the reading technic was at fault. There was a tendency to read the Kahn reaction lower than that

Table 3. *Eleven Laboratories Approved for Kahn Test Following Examinations of Two Series of Check Specimens*

Laboratory No.	No. Specimens Examined	FIRST SERIES				SECOND SERIES			
		Specimens Showing +++, +++ or ++++		Specimens Showing Difference Between Positive & Negative		Specimens Showing +++, +++ or ++++		No. Specimens Showing Difference Between Positive & Negative	
		No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
VIII	120	4	3.3	3	2.5	87	2	1	1.1
IX	69 <sup>1</sup>	3	4.3	0	0	87	0	0	0
X	69	11	15.9	8	11.6	87	1	1	1.1
XII	67	5	7.4	2	3.0	86	3	2	2.3
XIII	68	4	5.9	3	4.4	87	0	0	0
XV	68	5	7.3	2	2.9	87	1	1	1.1
XVI	69	5	7.2	4	5.8	87	4	3	3.4 <sup>2</sup>
XVII	67 <sup>1</sup>	0	0	0	0	87	0	0	0
XX	68	10	14.7	5	7.3	87	3	2	2.2
XXI	87	6	6.9	4	4.6	60	2	0	0
XXVII	87	5	5.7	1	1.1	60	1	0	0

1. These laboratories reported a large number of atypical reactions.

2. This laboratory examined a third series of check specimens and obtained complete agreement.



indicated by the amount of precipitate in the tests. One technician read the tests correctly in our laboratory but failed to do so in his own laboratory. On a recheck of this laboratory it was discovered that the glassware was so badly coated with a soap film that it was impossible to see the positive reactions in most tubes. In two other laboratories, the water bath was found to be defective. In five laboratories the technicians were not utilizing proper lighting conditions. In two laboratories the speed of the shaking machines was incorrect and hand shaking was being utilized in one.

After all these factors had been eliminated, a second series of check specimens were sent to these laboratories. The second part of table 3 shows the improvement obtained with this series of specimens. Laboratory X shows the most remarkable improvement since the percentage error decreased from 15 to 1. All laboratories excepting XVI were approved after the second series of specimens. This laboratory checked a third series of thirty specimens and obtained complete agreement.

When the initial survey of the Kahn test procedure was made it was found that the personnel of the several laboratories were anxious to conduct this test correctly. Wherever deviations were found in the Kahn technic, recommendations were accepted and carried out. The favorable results obtained in these thirty-one St. Louis institutions may be attributed to the splendid cooperation displayed by the personnel in all of these laboratories. They are now all reading more uniformly, are using the standard technic, the same lot of standard Kahn antigen, standard glassware, thermostatically controlled water baths and standard mechanical Kahn shakers. With all these factors standardized it is obvious that uniform results can now be obtained in all these laboratories. It is encouraging to know that some laboratories are checking their standard Kahn technic with other serological methods. This should give valuable information which ultimately will lead to further improvements in the serological diagnosis of syphilis.

The Health Division is formulating a program for the future with which it is hoped to show that identical results are being obtained with the Kahn test in all cooperating St. Louis laboratories. The Venereal Disease Service is planning on sending identical check specimens at regular intervals to each of these laboratories. In that way each individual laboratory will have the benefit of being checked by thirty similar institutions.

St. Louis Health Division Laboratory.

#### BIBLIOGRAPHY

1. Kahn, R. L.: The Kahn Test, Baltimore, Williams and Wilkins, 1928; Outline of Standard Kahn Test, U. S. Public Health Service, 1938.
2. The Evaluation of Serodiagnostic Tests for Syphilis in the United States, Ven. Dis. Inform., Supplement No. 1, 1935.

This study was made possible through the initiative and cooperation of Dr. J. F. Bredeck, Health Commissioner, and Dr. F. C. Gillick, Chief of the Venereal Disease Service. Acknowledgment is made of the valuable assistance given by Dr. L. J. Stephens, diagnostician in the Venereal Disease Service.

## SPASTIC COLON

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Spastic colon is a condition of the functional nervous system with a preponderance of the symptoms referable to the abdomen. It usually is not considered a disease and the underlying condition is not easily demonstrated; but it is one of the commonest, if not the commonest, abdominal complaint encountered in office practice. It has the ability to mock most, if not all, the abdominal diseases. It is known to mimic subacute appendicitis, chronic cholecystitis, carcinoma of the sigmoid, cecum and other portions of the large intestine, diverticulitis, diverticulosis, peptic ulcer, pyelitis, nephritis, cystitis, salpingitis, oophoritis and other diseases of the abdominal cavity. Many operations have been done in the past, and possibly will be done in the future, in hopes of removing or suspending some organ to improve the condition. It is obvious that the removal of an organ will not cure a condition of the functional nervous system. Too little space in medical literature has been devoted to this, one of the most outstanding problems in abdominal conditions today. Many methods have been developed by which one may rid the body of an offending appendix or gallbladder but not the spastic colon.

*Etiology.*—Little is known of the true etiology of this condition. Tidmarsh<sup>1</sup> speaks of local causes and general causes. He, as well as many other writers, believes the prolonged use of cathartics to be a responsible factor. Be this as it may, I have seen many cases in patients with regular bowel habits. Most writers have discarded the allergic theory for lack of sufficient evidence. The theories of infection and toxicity have likewise been abandoned.

One fact recognized by all observers is that the condition is one of the functional nervous system. The condition is more frequent in women in a ratio of 4 to 1. It is seen most frequently in the third, fourth and fifth decades although it is not unknown in children. Spastic colon and neurasthenia most always are coexistent. One could scarcely have spastic colon without first having that fatigue or exhaustion of the functional nervous system known as neurasthenia. Neurasthenia may be due to overwork, worry, financial reverses, loss of loved ones, menopause, borderline mental cases and other well known causes. Whatever causes neurasthenia, causes spastic colon.

*Pathology.*—People do not die of spastic colon. The cases are hard to follow to the autopsy table for this reason. The mechanism of the pain is not understood. It is most likely an overstimulation of the smooth muscles of the large intestine causing sensations of pain in a variety of degrees, depending upon the individual. Microscopic and macroscopic lesions are not found in the uncomplicated cases.

*Symptoms.*—The one symptom present in every case is pain. Without pain one could have no case of spastic colon. The site of the pain may be any place within the entire abdomen. Sometimes it is over the appendix and may stay in this one spot for days or even for years. No wonder many a patient is anxious to have this organ removed to ease his mind regarding the possibility of a ruptured appendix. Other times it remains over the lower portion of the sigmoid colon. This location has been the site of pain in one of my patients for six years. Many times the pain is high in the abdomen and mimics the pain of chronic cholecystitis and chronic peptic ulcer. Then again, the pain may be on the left side and on this side it is a little more difficult to find a disease to imitate. Perhaps diverticulitis will do. The pain is variable in intensity. Sometimes the pain will amount to severe cramps, so severe that morphine may be necessary. At other times the pain is barely noticeable. Usually the pain is of a mild nature, but annoying. Tenderness is usually present. Pressure over the portion of the abdomen described by the patient as the site of the pain will show tenderness. Women usually tell the physician they have "female trouble," when this condition manifests itself. They complain of pain just over the ovaries and tubes and many times ask the examiner if their "womb is tilted." It still is thought by many that a uterus in malposition causes much suffering. I have failed to notice any relationship between the position of the uterus and the presence or absence of abdominal pain. Excess abdominal gas is another symptom of common complaint. The patients complain of the "gas" pressing on their hearts, shutting off their air, swelling out their abdomens (bloating), causing much flatus, belching and other signs and symptoms of increased intra-abdominal pressure. Some complain of back-ache.

About 80 per cent of patients are constipated. About 15 per cent have normal bowel actions and the remaining 5 per cent have loose bowel movements. Mucous colitis, according to many writers, is but a form of spastic colon with the addition of mucus to the picture. It is quite evident that both are functional nervous disorders. If one considers mucous colitis as belonging to this group, as it should be, the symptoms of expelling mucus and occasional bleeding per rectum should be added to the symptomatology. No satisfactory explanation has ever been given for this phenomenon. Some individuals pass mucus in large amounts per rectum in addition to possessing the other symptoms described such as pain, tenderness and neurological manifestations.

Symptoms of the abdominal cavity are but part of the picture. The symptoms of neurasthenia must be mentioned to sum up the condition of spastic colon. These patients usually are tired and fatigued all the time. They are extremely nervous. They worry and fret over small things. They have been

through some miserable experiences in their lifetimes. They have had cause to worry. They have had children who did not heed their advice. They have had mates who were untrue, or fond of drink and gambling. They have had financial reverses.

These patients are subject to many pains in other parts of their bodies. Sometimes the pains radiate down both legs, sometimes up the back, sometimes in the head. They see spots before their eyes, they are dizzy, nauseated, have no appetite, cannot sleep at night, have headaches all the time; in fact, they suffer from every ache and pain to which man fell heir.

The gastric symptoms too must be mentioned. Patients with spastic colon also suffer from other functional disturbances of the stomach. They complain of excess fullness after eating, a feeling that their food "sours" and that the food does not digest. They complain of pain in the epigastrium after eating, and sometimes of pains similar to those of duodenal ulcer. These latter symptoms may be produced by spasm of the duodenum. Epigastric pain, however, is not nearly as common as pain in the lower abdomen.

The most frequent site of pain is over the sigmoid colon and the next most frequent over the cecum. The right upper quadrant is the third most frequent site of pain and around the navel almost as frequent. The left upper quadrant is the least common site of pain in spastic colon.

The abdominal pains that follow many abdominal operations are usually called "adhesions," but these pains in reality are most often due to a spastic colon. The spastic colon may have existed before the operation or may have appeared for the first time following the operation. The pain of adhesions has been greatly exaggerated.

Children are known to have spastic colon at times. I have observed more than one child who has complained of pain in the abdomen which after other examinations, has been definitely proved was due to a spastic condition of the colon. These pains attack children of most any age and the children complain of much abdominal pain. Often the pain disappears when the child's attention is diverted from the pain to something more interesting. I have observed pain in three such children over a period of eight years with no other symptoms presenting themselves.

*Diagnosis.*—As in every other phase of medicine, more serious pathological conditions must be eliminated. A barium enema and a sigmoidoscopic examination are usually necessary to make sure of the diagnosis. The barium enema will show spastic markings of the colon; but these in themselves are not diagnostic as they also occur in patients not having pain. However, the exclusion of organic pathological condition is a most reliable sign. A white blood count should help in cases suspected of being appendicitis. A gallbladder dye examination should help in cases suspected of gallbladder



condition. Often gallbladder disease and spastic colon coexist. A careful history and careful observation are the best guides in all cases. When a history of abdominal pain is given by a patient who has neurasthenic tendencies, one should search for spastic colon. The dramatic tale told by some of the patients, however, is sufficient to make one wish to do an exploration of the abdomen at once. The condition is always represented as being the worse pain imaginable, of such intensity that the patient wishes to tear out her hair and jump in the river. And, the more the patient talks and describes her history, the more one realizes there is a neurological factor behind it.

*Treatment.*—If one could only treat this condition as one does malaria, syphilis and pernicious anemia! But one must try and convince the patient, against his or her will, that he does not have a fatal disease, that he does not have cancer and that he does not require an immediate operation. I have observed, however, that most patients do not want an operation for this condition. They themselves must suspect it is not an organic disease. Finney<sup>2</sup> places much emphasis upon regulation of the bowels and attempting to re-educate the patient to normal bowel habits. I have found this almost impossible. My patients insist on having a bowel action every day if it takes an ounce of croton oil a day to have it. Mere oil and agar are not enough; some have been taking an enema every day for the last few years. Others have been taking laxatives every day or every other day for thirty or forty years. I have to permit the use of them. While they may do harm and may keep the colon agitated, I am not sure of this. I have found that patients not having their proper bowel movements, because they were not taking laxatives, were actually worse as far as their spastic colons were concerned. Therefore, I permit the use of laxatives.

When laxatives are deemed necessary for the welfare of the patient, the old reliable Hinkle pill is as good, if not better, than most cathartics on the market. Some require one a day and some require as many as four; the smaller the number, the better. Agar and oil will do well in some cases. Most patients prefer Hinkle pills to the oily mixtures, however.

For some patients, rest and a change of environment is absolutely necessary. They will not show any signs of improvement until they get away from their old job for a while and rest. Rest in bed is not always necessary, however.

Atropine in large doses seems to help some. I have seen doses of 1/100 of a grain two or three times a day help. Mild doses of the tincture of opium may serve to quiet the bowel and thus gain the confidence of the patient. It may be discontinued after a week or two with no bad effects. It is certain that this drug is the best bowel sedative yet found. It is a habit forming drug when taken over a period of years, although I have never seen

a patient addicted to or even wanting this particular form of medication.

I have used large doses of vitamin B with some beneficial results. Most of the benefit was due to a general effect upon the patient rather than a local effect upon the large intestine. Vitamin B can be given in the form of any of the commercial capsules now available on the market. I have used Lilly's "Betalin Capsules" with good results. Six capsules a day is the ideal dosage.

Theelin and estrone are certainly helpful in female patients between the ages of 35 and 55. It helps their general outlook upon life and seems to relieve their nervousness and abdominal pain. I give these preparations intramuscularly, and even subcutaneously, in 5000 international units once a week. Severe cases are given two doses a week, or one 10,000 unit injection. These high doses come in oily injections only.

Acetylsalicylic acid in doses of 15 to 30 grains a day help many patients. Some patients can not take this remedy because of its acid reaction in the stomach, thus causing much gastric distress. Other patients claim it helps them greatly.

The elixir of phenobarbital, or 1/4 grain tablets of phenobarbital, has been helpful in the more nervous patients. It is best, however, if one can treat the condition without the use of phenobarbital. Only the extremely nervous patients are given this remedy, otherwise the patients may complain of being tired all of the time. The elixir is given in teaspoonful doses three or four times a day; in some cases half this amount is given. I have tried sulphanilamide in these spastic conditions but have seen no changes in the patients with this therapy.

A most excellent remedy for cases in which abdominal gas is the most outstanding symptom is bile salt. Doses of 40 or 50 grains a day I find best in this condition of excess gas in the colon due possibly to excessive bacterial action within the colon. I know for years I searched for a remedy that would assist the patients plagued with excessive abdominal gas and until large doses of bile salts were made available for commercial purposes I was at a loss to help them. At present I am using the 5 grain bile salt tablets. The tablets are but slightly laxative and their effect upon patients suffering from excess gas formation is remarkable. Cases of mild cholecystitis are benefited greatly by two 5 grain tablets after each meal. The cholagogue effect is astounding.

I wonder if diet is of any value in spastic colon. Perhaps it is in the mind of the patient. The elimination of beans, cabbage, onions, garlic, lunch meat, sauerkraut, chili, pepper, excessive amounts of fats and sweets from the diet is of some value. Most of the value may be psychic, however.

For patients that are always tired and run down, I prescribe caffeine. I prescribe this in addition to the vitamins. I might add too that liver preparations such as Lextron capsules (Lilly) may fur-

nish a certain stimulation to the patient that vitamin B by itself may not do. I have used these capsules in doses of six a day with some encouraging results in certain individuals. Caffeine helps many patients. The caffeine is given in the citrated form as a rule, in capsules containing 5 grains each of caffeine citrate. Some patients receive one capsule a day in the morning, while the more severe cases receive three capsules a day. It does not seem to make the patient nervous.

The last and most important therapeutic agent is reassurance. This can not be stressed too much. Without reassurance, the patient would go to one physician after another with no help or encouragement. The best plan is to have a barium enema roentgen ray of the large bowel made by a competent roentgenologist and, with his permission, show the report to the patient. This report clearly shows no organic lesion to be present and the patient is usually greatly relieved. With this knowledge in mind, the pains do not occur as often and they come with less severity. Without roentgen rays it is a little harder. The patient must take the word of his physician. A sigmoidoscopic examination by a proctologist should have the same effect as a roentgenological report. Confidence in the physician is essential. Fortunately, in this day of family physicians, one is able to maintain the confidence of the patients to a certain extent. Reassurance is more than half of the battle. Once the patient realizes he does not have an incurable disease his pains become less and less and the frequency of the attacks is less. The majority of patients eventually educate themselves to ignore or minimize the attacks. In later years, the attacks disappear. We do not hear of spastic colon in the aged. Presumably, their worries are over.

The few cases given here illustrate the type of conditions with which one is dealing. Most of the conditions have a neurological origin; several of the patients have had operations.

#### CASE REPORTS

Case 1. This patient complained of severe pain over both tubes for several days. She stayed in bed constantly and her only relief was by the constant application of ice bags to the lower abdomen. She was but 21 years of age but had been having her share of difficulties. She had left her husband and was in poor financial condition. She was nervous, felt nauseated at all times and could not sleep. Her white blood count was within normal range and she had no fever. Her appendix had been removed at some earlier date. Upon consultation, it was decided an exploratory operation was necessary to find out what was causing such terrible pain for she did nothing but complain of the severe pain in her lower abdomen and begged for relief. Upon bimanual examination, both tubes and ovaries appeared to be tender and somewhat enlarged. She had an obese abdomen and palpation was rather difficult. Due to her pleading, an exploratory operation was performed without sigmoidoscopic examination or barium enema. The tentative diagnosis was afebrile salpingitis. Upon opening the abdomen no pathological condition whatsoever was found. The patient was closed quickly and two

days later felt better than she had. At times she has recurrence of her pains but never as severe as the time of her operation, six years ago. Diagnosis was spastic colon.

Case 2. The second case of interest is a man of 50 years. He is quite introspective, as are many of these patients, and is rather nervous. This patient has had a history of pains in the abdomen for a period of fifteen years. About eight years ago a gastro-enterostomy was done to relieve his terrific pains. At that time the patient must have had many pains in the upper abdomen and undoubtedly there was a gastric ulcer present. But the pains in his lower abdomen continued. When he is at home and not working the pains are not so severe, but when he is working hard at the factory his pains are terrific. They are so bad he has to come home early from work. Barium enemas on three different occasions in two different hospitals have resulted in diagnosis of spastic colon. Sigmoidoscopic examinations in these same hospitals have given negative findings. On one occasion he spent a month in one of these hospitals. He was greatly improved by this rest but the pains returned after he went back to work. Exhaustive tests made at this hospital showed nothing other than spastic colon. The pains are so severe that even opium will not relieve them. He doubles up when one attempts to press upon his stomach. He has few neurasthenic symptoms other than those referable to the abdomen. His only help is rest from his work. Diagnosis is spastic colon.

Case 3. This patient, a man aged 45, has met with lots of sorrow in his life. His work is most unpleasant to him, his family is difficult to manage, he has lost a child, he was once kidnapped by gangsters and has had many shocking experiences. Now he suffers with attacks of intense pain in the abdomen which are severe and last for several hours. No alkalies relieve the pain. The pains have no relation to the food he eats but do have a relationship to his emotional life. When he is under a mental strain, the attacks occur. They seldom appear when he is free from trouble.

The pains appear in the lower abdomen and are of a cramping nature. They cause him to lie in a doubled-up position. Sometimes an enema relieves the pain. A sedative hypodermic will relieve the pain as will sedatives by mouth. On one or two occasions he has passed blood per rectum in small amounts. The condition has existed for three years. Roentgen ray examination by a reliable laboratory shows only a spastic colon. He has never had an operation of any kind. Diagnosis is spastic colon.

Case 4. A woman, aged 47, complains of intense pain in her lower abdomen, choking sensations in her throat, fluttering of the heart, indigestion after each meal, insomnia, hot flashes and general nervousness. She has had these symptoms for four years or more. She has always been a little nervous, but now is worse. She is constipated.

Examination shows her abdomen to be rather tender in the lower portion. The adnexia is slightly tender but the ovaries are not enlarged and the tubes can not be palpated. There is some pain on bimanual palpation of the ovaries and uterus.

The patient states the pains are present most of the time. They are never cramp like but a dull ache in the abdomen at all times. The rest of the physical examination is negative. Roentgen ray examination reveals no evidence of pathological condition. The sigmoidoscopic examination shows normal results. This patient improved by keeping her bowels moving each day and by using a sedative and vitamin therapy. She also received weekly doses of 5000 units of estrone. Diagnosis is spastic colon.

3616 South Broadway.



# BIBLIOGRAPHY

1. Tidmarsh, C. J.: Management of Functional Disorders of Colon, *Internat. Clin.* **4**:162-172 (December) 1938.
2. Finney, J. O.: The Spastic Colon, *J. M. A. Alabama* **8**: 233-237 (January) 1939.
3. Cook, Hardy: Spastic Colitis, *Tri-State M. J.* **11**:2206 (January) 1939.
4. Soper, Horace W.: Colon Spasm, *Radiology* **30**:196 202 (February) 1938.
5. Bacon, H. E.: Anus, Rectum, Sigmoid Colon, Philadelphia, J. B. Lippincott Co., 1938, p. 274.
6. Jordan, Sara M., and Kiefer, E. D.: The Irritable Colon, *J. A. M. A.* **93**:592-595 (August 24) 1939.
7. Kantor, J. L.: Unstable Colon, *South. M. J.* **25**:29 37 (January) 1932.
8. Spriggs, E. I.: Functional Disorders of the Colon, *Quart. J. Med.* **24**:533-565 (July) 1931.
9. Rowe, A. H.: Revised "Elimination Diets" for Diagnosis and Treatment of Food Allergy, *Am. J. Digest. Dis. & Nutrition* **1**:387-392 (August) 1934.
10. Rosenberg, David H.; Arens, Robert A.; Marcus, Philip, and Necheles, Heinrich: Benzidine Sulfate in Spastic Colon, *J. A. M. A.* **110**:1994-1999 (June 11) 1938.

## PRONTOSIL IN PYOPNEUMOTHORAX

LAWRENCE SCHLENKER, M.D.

ST. LOUIS

Two cases of malignant pyopneumothorax, developing in patients with tuberculosis during the administration of pneumothorax treatment, were carried to complete recovery by the use of prontosil intrapleurally, as well as intramuscularly, and in conjunction with repeated aspirations of the pleural fluid.<sup>1</sup>

In both cases the complication came on in the sudden and violent manner characteristic of this type of pleural infection; with chills, fever of from 103 to 104 F., severe chest pain, dyspnea and vomiting. To relieve the emergency, aspiration was at once and repeatedly resorted to with the usual temporary relief. Employment of the various dyes and antiseptics, including oleothorax, in the light of past experience was considered loss of important time but a trial was made of dettol, a saponified xylol derivative recommended by Gilmour, with no noticeable effect. The condition of both patients becoming steadily worse, the use of prontosil was determined upon although the pleural fluid showed no bacteria on direct smear nor did its culture give any growth on blood agar. Intrapleurally, 5 or 10 cc. of the prontosil was instilled after each aspiration of fluid at intervals from three to seven days. Intramuscularly, 5 cc. of the dye was injected into the buttocks every one to three days.

Improvement was noted after the first injections and was steadily and consistently maintained. The temperature became normal in twenty-two and thirty-five days respectively, while total and permanent absence of the pleural fluid was shown by radiographic examination after fifty and fifty-seven days. The total amounts of fluid aspirated were 3,725 and 5,469 cc. in twelve and seventeen operations. There was a short rise of temperature some hours after the intrapleural injections but no other reactions to the dye were seen. Bronchopleural or

chest wall fistulas threatened at no time. Pleural adhesion, resulting from the fluid presence, reduced the lung collapse in one case from 80 to 25 per cent, in the other from 70 to 30 per cent. Both patients became symptom free, having no fever, cough, expectoration, pain or dyspnea. Strength and weight returned to their normal and the patients have fully resumed their former vocations at which they have continued without relapse for two years since recovery.

It is assumed, by virtue of experience, that the treatment described obviated the probable necessity of a thoracoplastic operation. Furthermore, by stopping the long continued exposure of the pleura to a highly infectious fluid, it prevented the development of amyloid disease, other complications and the entrance of the patient into a cachectic state to which there would have been but one ending.

3515 South Grand Boulevard.

## SULFATHIAZOLE PRODUCES THE RECOVERY OF TWO PATIENTS WITH SEPTICEMIA

The recovery of two patients from septicemia (bacteria in the blood) was brought about by treatment with sulfathiazole, a new sulfanilamide derivative, W. Calhoun Stirling, M.D., Washington, D. C., reports in *The Journal of the American Medical Association* for July 13. He also used sulfathiazole with success in twenty-five other cases of urinary infections. Many of these infections had not responded to sulfanilamide treatment. In the author's opinion sulfathiazole seems less toxic (poisonous) and more effective than other members of the sulfonamide group, nausea being the only side effect seen, and this subsides quickly when the drug is discontinued. "In sulfanilamide-resistant infections," he says, "sulfathiazole offers a new avenue of attack which in the few cases in which it has been used seems to justify the claims made for it."

Sulfathiazole is absorbed and eliminated quickly but this is obviated by giving it more often than other sulfanilamide compounds are given.

## URGES EFFECTIVE ANTIFIREWORKS LAWS

"Already the American Medical Association has circularized hospitals, dispensaries and other institutions in the United States with a view to compiling within the near future a record of accidents and mortality resulting from injuries on the Fourth of July due to ignorant or too enthusiastic employment of fireworks," *The Journal of the American Medical Association* for June 29 says in an editorial. "Many states have already adopted effective antifireworks legislation; but last year at least 5,560 people were injured, and at least thirteen died as the result of such celebrations. The majority of cases were mutilations received by boys or men who used home-made explosives, and burns of little girls whose dresses were set on fire by sparklers and fire crackers. In 1938 Pennsylvania led all other states, with six deaths from fireworks. In 1939 the records indicated that there was not one death in that state. It is about time that every state in the Union adopted effective antifireworks legislation. The contrast, in recent years, between Pennsylvania, Utah and West Virginia, which adopted such legislation, with Indiana and Maryland, which postponed legislation, should be sufficient warning to every state that the time has come to cease postponing such action."

1. Schlenker, Lawrence: Prontosil in Pyopneumothorax, *Illinois M. J.* **75**:555 (June) 1939.

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SEPTEMBER, 1940

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## EDITORIALS

### THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

### MEDICAL PREPAREDNESS

The first thing the medical profession has been called upon to do in promoting national defense is to make available information on their individual capabilities of serving in various military, naval, industrial or civic capacities should need arise. This information is being assembled by the Committee on Medical Preparedness of the American Medical Association, appointed by the House of Delegates at the New York Session to cooperate with the National Defense Commission, the Army and Navy Medical Corps, the United States Public Health Service and other federal agencies in preparing our nation medically to meet any emergency.

Questionnaires have been sent to every physician in this country so that information upon his abilities and preferences may be available if his service is needed. While it would be of greater advantage to national defense to place each physician in a capacity in which he can render the greatest aid, it also would be to the advantage of the physician to be placed in the capacity which he prefers. Therefore, for the welfare of national defense and personal preference physicians should return the questionnaire promptly. If a physician has failed to receive a questionnaire or has mislaid it, application for a duplicate should be made to the state chairman of the committee, Dr. Robert Mueller, St. Louis, in care of the Missouri State Medical Association, Missouri Bldg., St. Louis.

The questionnaire which is accompanied by a return envelope is sent direct to the American Medical Association and the Missouri State Medical Association has no record of the individuals returning the questionnaires except by a postcard sent out by the Association. This card to determine which members have sent the questionnaire to the American Medical Association has been used to encourage members to send in the questionnaire and to determine who may have misplaced or have not received the questionnaire. Because of the volume of work the American Medical Association is conducting with the questionnaires it is impossible at this time to determine from them the individuals who have made returns.

Missouri physicians have returned 46.3 per cent of questionnaires. The average of all state returns is 43.9 per cent, the highest being Nebraska with 71.4 per cent.

The functions of the Committee include (1) consideration of problems involved in providing medical personnel for military, naval and civilian needs; (2) consideration of the provision of medical personnel for physical examinations, particularly of young men who are conscripted for military service, young men assigned to vocational training, persons on relief and those concerned with war industries; (3) consideration of economic problems including financial arrangements, leaves of absence, part time service and other factors associated with civilian



medical services; (4) maintain contact and represent the Association in conferences with the Surgeons General of the Army, Navy and Public Health Service and, when necessary, with other governmental agencies; (5) maintain contact with the state chairmen on medical preparedness; (6) encourage and coordinate the activities of the several state chairmen for the Committee on Medical Preparedness; (7) formulate instructions for the guidance of state chairmen, and (8) review and approve or disapprove recommendations received from state chairmen.

At a meeting of the Committee on Medical Preparedness held in Chicago on July 19 the following resolutions were adopted:

(1) WHEREAS, The maintenance of the health of the workers in industry is essential to the defense program of the country, and

WHEREAS, The prevention of unnecessary illness of workers in industry is necessary to insure uninterrupted production of essential materials, and

WHEREAS, There exists a shortage in the number of physicians, chemists, mechanical engineers and other professional groups skilled in industrial hygiene, therefore be it

*Resolved*, That the Committee on Medical Preparedness of the American Medical Association recommends to the National Defense Commission that the necessary funds be furnished to the United States Public Health Service to provide the necessary training of physicians, chemists, mechanical engineers and other professional personnel in order to cope with the industrial hygiene problem in the present national emergency.

(2) WHEREAS, The maintenance of the health of the nation is fundamental to its welfare, and

WHEREAS, The education and training of medical personnel requires long periods of time and special selection of men and women qualified to undertake such study, and

WHEREAS, It is necessary for such purposes to maintain continuous education of medical students, therefore be it

*Resolved*, That the Committee on Medical Preparedness of the American Medical Association requests the National Defense Commission, the military and naval services, the United States Public Health Service and the Congress, in preparing for the conscription of personnel, to provide for the continuation of medical education and for exemption from conscription of all medical students and interns in accredited and approved institutions.

(3) WHEREAS, There are many organizations interested in health and medical preparedness, and

WHEREAS, These organizations represent various specialties interested not only in the prevention but the treatment of disease, and

WHEREAS, Many recommendations and plans for medical preparedness will be made by these groups, therefore be it

*Resolved*, By the Committee on Medical Preparedness of the American Medical Association that we recommend to the President of the United

States and to the National Defense Commission the immediate appointment of a medical coordinator of the activities of all medical service related to the national defense program.

#### ANNUAL FALL CLINICAL CONFERENCE OF THE KANSAS CITY SOUTHWEST CLINICAL SOCIETY

The Annual Fall Clinical Conference of the Kansas City Southwest Clinical Society will be held in Kansas City, Missouri, September 30 to October 3.

Guest speakers will include Drs. Arthur M. Alden and Quitman U. Newell, St. Louis; Dr. John Alexander, Ann Arbor; Dr. Charles A. Bahn, New Orleans; Drs. C. J. Barborka, James G. Carr and Fred M. Drennan, Chicago; Dr. Willis C. Campbell, Memphis; Dr. Elliott C. Cutler, Boston; Dr. Thomas Fitz-Hugh, Jr., Philadelphia; Dr. L. H. Garland, San Francisco; Dr. Roscoe R. Graham, Toronto; Drs. L. Emmett Holt, Jr., John T. King and Harvey B. Stone, Baltimore; Dr. James S. McLester, Birmingham; Dr. J. Bedford Shelmire, Dallas, and Dr. Ira R. Sisk, Madison.

In addition to the guests, twenty-nine members of the Clinical Society will appear on the program which will be conducted as a single general assembly on each day. Two evening panel discussions will be presented on "Anemia" and "The Heart," each of which will be followed by open discussion by the audience.

Additional features include scientific and technical exhibits, daily round table luncheons, radio broadcasts, an evening of entertainment for physicians, entertainment for visiting women and alumni dinners.

The August issue of the *Kansas City Medical Journal* carries the scientific program and is available through the executive office, 208 Shukert Building, Kansas City. Registration for the clinic is \$5 and associate membership blanks will be sent upon request that membership cards may be obtained prior to the meeting.

#### GROUP HOSPITAL SERVICE, INC.

Group Hospital Service, Inc., St. Louis, concluded its fourth year on May 1, 1940, and the annual report was issued recently. During the year there was a net increase in contracts of 47.3 per cent while the number of persons protected increased 67.3 per cent. The greatest increase was in coverage for husband and wife and families. The net increase for single persons was 33.1 per cent, for man and wife 89.1 per cent and for families 76.2 per cent. There was 10.2 per cent cancellations of contracts during the year. At the close of April 1940 there were 60,583 contracts in force covering 115,754 persons. At the close of the first year there were 8,114 contracts in force; 11,940 were added the second year, 18,020 the third year and 22,509 the fourth.

During the four years Group Hospital Service has paid \$645,960.54 to hospitals in St. Louis and \$72,308.47 to affiliated outstate Missouri, Illinois and nonmember hospitals, totalling \$718,269.01. This represents 16,074 patients with 144,442.5 days care.

The financial report showed admitted assets on May 1, 1940, of \$363,515.44, an increase of \$165,188.65 during the fourth year of operation. All liabilities, actual and potential, were \$161,649.42 with free reserves and surplus of \$201,866.02.

While much progress has been made by approved voluntary hospital service plans in the last five years, one problem which still remains to be solved is the extension of voluntary method of budgeting for needed hospitalization to serve those who are engaged in agricultural pursuits and those dependent for their livelihood upon farm sources. The problem is severalfold: (1) variance in periods of income; (2) lack of cohesiveness in groups not specifically formed for the purpose of joining the hospital plan; (3) necessity for considerable education as to the need for scientific care; (4) satisfactory accommodations in approved institutions; (5) need of an economical and central method of collecting monthly dues, and (6) inability to obtain concentrated community support.

Plans to enroll whole communities have been established in Minnesota, in western New York and Connecticut. In Missouri a plan recently was presented to an entire county. Through the active sponsorship of the local county medical society, mayors of the respective towns in the county, service clubs, the Farm Bureau and civic leaders 900 persons of 2,700 eligible in Bates County have been enrolled by Group Hospital Service.

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#### PHYSICIANS NEEDED FOR ARMY SERVICE

The physician, as every other American, has become actively interested in national security and stands ready to contribute his services as required for military preparedness. One immediate problem in this connection concerns the War Department and, primarily, the young physician. According to the Surgeon General, U. S. Army, Washington, D. C., the War Department must procure sufficient additional personnel from the medical profession to augment the medical services of the Regular Army as the various increases are made in the strength of the Regular Army, as authorized by Congress to meet the partial emergency. The young physician is especially concerned because it is usually advantageous and is often more convenient for him to serve with the Army.

Present plans of the War Department are designed to make service attractive and instructive for the young physician. If the physician holds a Medical Corps Reserve commission he can be ordered to active duty if he so requests. If he does not hold a commission but is under 35 years of age and is a comparatively recent graduate of an accredited school, he may secure an appointment in the Medical Corps Reserve for the purpose of

obtaining extended active duty for a period of one year or longer. Duty is given at general hospitals, station hospitals and with tactical units and embraces all fields of general and specialized medicine and surgery. Excellent postgraduate training is obtainable in connection with aviation medicine. After serving six months of active duty in the continental United States, a reserve officer may request duty in Hawaii, Panama or other United States territories and possessions. The initial period for duty is one year and yearly extensions are obtainable thereafter until the international situation becomes more clarified and our domestic military program becomes stabilized.

Many young doctors who have served with the Army on extended active duty have taken the competitive examination for entrance into the Medical Corps of the Regular Army. Extended active duty affords an excellent opportunity for the physician to observe modern military medicine and the facilities that exist for a complete and comprehensive medical practice.

Pay is according to rank and, including subsistence and quarters allowances for an officer with dependents, amounts to an annual sum of \$3,905 for a captain and \$3,152 for a first lieutenant; or, without dependents, to an annual sum of \$3,450 for a captain and \$2,696 for a first lieutenant. In addition reimbursement is made for travel to duty station and return.

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#### NEWS NOTES

Dr. Hugh L. Dwyer, Kansas City, has been appointed Director of Health of Kansas City.

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Dr. Robert E. Schlueter, St. Louis, has been elected vice president of the Medical Library Association for 1940-1941. Other officers are: President, Colonel Harold W. Jones, Army Medical Library, Washington, D. C.; secretary, Miss Anna C. Holt, Harvard Medical School, Boston; treasurer, Miss Louise D. C. King, Baltimore; member executive committee, Dr. Sanford V. Larkey, Baltimore; member nominating committee, Miss Mildred V. Naylor, Newark.

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The twelfth annual inactive status training course for Medical Department Reserve officers of the United States Army and Navy will be held at the Mayo Foundation, Rochester, Minnesota, October 6 to 20. As in former years, special work in clinics and hospitals will be offered during the morning hours for those asking special assignments. Presentations of selected subjects in military medicine are scheduled. There will be appropriate sections or special courses for officers of the Dental and Veterinary Corps. All Medical Department Reserve officers on the active list are eligible for enrollment. Approved applicants will



be enrolled on the recommendation of the Surgeon of the Seventh Corps Area or the Surgeon of the Ninth Naval District. Applications should be made at an early date and should be forwarded through the respective reserve headquarters of the officers concerned.

Drs. Andy Hall, Jr., Fred Kramer and William J. Thompson, St. Louis, were guests of the Pike-Calhoun County (Illinois) Medical Society at Barry, Illinois, June 25. Dr. Hall spoke on "Urinary Tract Infections," Dr. Kramer on "Vitamin Deficiencies and Their Relationship to the Gastrointestinal Tract," and Dr. Thompson on "Surgical Management of Gastrointestinal Malignancy."

United States Civil Service examinations have been announced for pathologist (medical), veterinarian (research), senior medical officer, medical officer and associate medical officer. Application blanks and information may be obtained from the Board of United States Civil Service Examiners at any first or second class post office or from the United States Civil Service Commission, Washington, D. C.

Physicians are needed for the medical service of the Civilian Conservation Corps in Missouri, Minnesota, North Dakota, South Dakota, Iowa, Nebraska, Kansas and Arkansas. The initial salary is \$3,200 a year, not including maintenance. The principal duties at camps consist of the medical care of enrollees and the practice of preventive medicine. Applications should be submitted to the Office of the Surgeon, Headquarters Seventh Corps Area, Federal Building, Omaha, Nebraska, giving the date on which the applicant is available and the preference of state to which he may be assigned.

Several medical reprints are being released by the American Society for the Control of Cancer, 350 Madison Avenue, New York City. Copies without charge will be sent to any physician writing for them. In the past these leaflets have been sold at prices ranging from 5 to 50 cents. The reprints available are "Cancer of the Breast," Arthur H. Estabrook, Ph.D.; "Biopsy in Mammary Cancer," James Ewing, M.D.; "The Doctor's Practical Relation to the Cancer Problem," William Carpenter MacCarty, M.D.; "The Responsibility of the Practitioner in Menopausal Bleeding," James E. King, M.D.; "Early Diagnosis of Carcinoma of the Cervix," Henry Schmitz, M.D.; "The Family Physician's Place in the Control of Cancer of the Uterus," S. W. Cathcart, M.D.; "Transillumination of the Breast," Max Cutler, M.D.; "Cancer of the Breast," Grantley W. Taylor, M.D.; "Collective Review of the Recent Literature on Malignant Tumors of the Uterus," George H. Gardner, M.D., and George C. Finola, M.D.; "Radiosensitivity of Tumors," Fred W. Stewart, M.D.; "Cancer of the Stomach," Howard K. Gray, M.D., and Donald C. Balfour, M.D.

As part of the National Defense program, a nationwide registration of aliens will be conducted from August 27 to December 26 by the Immigration and Naturalization Service of the Department of Justice. Registration will take place in the post offices and it is expected that more than three and a half million aliens will be registered during the four month period. Registration was made compulsory by an act of Congress, the Alien Registration Act of 1940. The law requires all aliens 14 years or older to be registered and fingerprinted. Alien children under 14 will be registered by their parents or guardians and will register in person and be fingerprinted when they reach their fourteenth birthday. A fine of \$1,000 and imprisonment of six months is prescribed for refusal to be fingerprinted or for making registration statements known to be false. The Immigration and Naturalization Service asks for the cooperation of all citizens in carrying out the registration program in a friendly manner and states that citizens may be of great help to non-citizens by explaining to those who do not speak English well what the registration is, where aliens go to register and what information they must give.

"Osler at Old Blockley," a painting in oil by Dean Cornwell, was unveiled at the dedication of the Osler Memorial Building on the grounds of the Philadelphia General Hospital this past June and was later exhibited at the American Medical Association convention in New York.

The painting depicts one of Osler's outstanding contributions to medicine, namely, bringing medical students to the bedside of the patient for clinical study. In the painting Osler is shown at the side of an elderly patient on the hospital grounds. Surrounding Osler and the patient are internes who have stopped with him as they were on their way to the autopsy house to observe one of his famous post-mortems. This autopsy house, now the only Osler Memorial Building in the United States, is shown in the background. This memorial was made possible by a grant from John Wyeth & Brother.

"Osler at Old Blockley" is the second painting in the series "Pioneers of American Medicine" sponsored by John Wyeth & Brother as part of a project



to highlight the contributions of Americans to the advancement of medicine. "Beaumont and St. Martin" was the first painting in the series.

Colored reproductions of "Osler at Old Blockley," suitable for framing may be obtained free by addressing requests to E. H. Bartelsmeyer, 623 Missouri Building, St. Louis, Missouri.

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Nonofficial Remedies:

#### Abbott Laboratories

- Liver Extract-Abbot (Powder) in Capsules
- Liver Extract-Injectable, U.S.P., Abbott, 5 U.S.P. Units
- Liver Extract-Injectable, U.S.P., Abbott, 10 U.S.P. Units

#### Arzol Chemical Co.

- Arzol Ferric Swabs

#### Calco Chemical Co., Inc.

- Sodium Sulfapyridine Monohydrate—Calco

#### Cutter Laboratories

- Pollen Extracts—Cutter (Acacia; Alder; Alfalfa; Alkali Rye Grass; Almond; Annual Blue Grass; Aspen; Barley; Bent Grass; Birch; Bract Scale, Brome Grass; Broncho Grass; Canada Blue Grass; Chapparal Broom; Cheat Grass; Chrysanthemum; Clover; Coreopsis; Cosmos; Cultivated Rye; Curly Dock; Dahlia; Dandelion; Date; Deodar Cedar; Elm; English Walnut; Eucalyptus; False Coastal Ragweed; Field Oats; Field Wheat; Goldenrod; Greasewood; Hops; Incense Cedar; Koehler's Grass; Locust; Mesquite; Mexican Tea; Monterey Cypress; Mountain Sagebrush; Mustard; Pasture Sagebrush; Pecan; Perennial Rye Grass; Pickleweed; Poverty Weed; Prairie Sagebrush; Privet; Quack Grass; Rabbit Brush; Rose; Salt Grass; Shasta Daisy; Sheep Sorrel; Slender Wheat; Southern Ragweed; Spearscale; Spiny Amaranth; Squirrel Tail; Sugar Beet; Sunflower; Sweet Vernal; Sycamore; Tall Oat Grass; White Valley Oak; Willow; Yellow Pine)

#### Endo Products, Inc.

- Ampoules Caffeine with Sodium Benzoate, 2 cc.

#### Lederle Laboratories, Inc.

- Staphylococcus Antitoxin "Globulin-Lederle-Modified"

#### National Drug Company

- Diphtheria Toxoid, Plain, 3 cc. Ampul-Vial (1 immunization, 3-1 cc. doses)
- Diphtheria Toxoid, Plain, 15 cc. Ampul-Vial (5 immunizations, 3-1 cc. doses)
- Diphtheria Toxoid Refined, Alum Precipitated (1 immunization, 2 doses, 1 cc. each)
- Diphtheria Toxoid Refined, Alum Precipitated (10 immunizations, 2 doses, 1 cc. each)

#### Sharp & Dohme

- Antipneumococcal Serum, Concentrated (Pneumococcus Antibody Globulin, Types I and II)—Mulford, 20,000 unit package

- Antipneumococcal Serum, Concentrated (Pneumococcus Antibody Globulin, Types I and II)—Mulford, 50,000 unit package

#### Winthrop Chemical Co., Inc.

- Diodrast Sterile Solution (35 per cent, weight/volume) 30 cc.

#### Atabrine Dihydrochloride

- Tablets Atabrine Dihydrochloride (Sugar Coated), 0.1 Gm. (1½ grains)

- Tablets Atabrine Dihydrochloride 0.1 Gm. (1½ grains)

- Tablets Atabrine Dihydrochloride 0.05 Gm. (¾ grain)

- Ampules Atabrine Dihydrochloride Powder 0.2 Gm. with Ampules, 10 cc. size, Sterile Distilled Water

#### John Wyeth & Brother, Inc.

- Silver Picrate Jelly 0.5%—Wyeth

- Soluble Trituration Silver Picrate 20% with Boric Acid 80%

#### Sulfapyridine—Wyeth

- Tablets Sulfapyridine—Wyeth, 0.5 Gm. (7.7 grains)

The following articles have been accepted for inclusion in the List of Articles and Brands Accepted by the Council But Not Described in N.N.R. (New and Nonofficial Remedies, 1940, p. 560):

#### Endo Products, Inc.

- Ampoules Calcium Chloride Solution—Endo

#### Lakeside Laboratories, Inc.

- Ampules Magnesium Sulfate—Lakeside, 25%, 2 cc.

- Ampules Magnesium Sulfate—Lakeside, 10%, 10 cc.

- Ampules Magnesium Sulfate—Lakeside, 10%, 20 cc.

## ORGANIZATION ACTIVITIES

### MEDICAL LEGISLATION

The following bills have been introduced in Congress: S. 4269, introduced by Senator Wagner, New York, proposes to amend the Social Security Act and the Internal Revenue Code so as to extend old-age and survivor insurance benefits and unemployment benefits to, among others, employees of non-profit religious, charitable, scientific, educational and anticruelty organizations, except ordained ministers and members of religious orders performing their duties in such orders and student nurses and interns. H. R. 10334, introduced by Representative Elliott, California, and H. R. 10360, introduced by Representative Murdock, Arizona, propose to authorize the Surgeon General of the United States Public Health Service to allot to the several states



and political subdivisions thereof and the District of Columbia federal grants-in-aid to be used for establishing and maintaining adequate measures for the prevention, treatment and control of tuberculosis among migrants, and also for studying, investigating and demonstrating methods of developing more effective measures for accomplishing that purpose, including the training of personnel. Federal funds appropriated each year, not to exceed \$1,000,000 for the fiscal year 1941, are to be allotted on the basis of (1) the migratory population, (2) the extent of the tuberculosis problem among the migratory population, (3) existing facilities for the care of tuberculosis patients and (4) the financial needs of the respective states and other areas. Necessary rules and regulations are to be prescribed by the Surgeon General, with the approval of the Federal Security Administrator and after consultation with a conference of state and territorial health officers.

## DEATHS

**Kuhn, Harold Philipp, M.D.**, Kansas City, graduate of the University of Kansas School of Medicine, Lawrence, 1906; member of the Jackson County Medical Society; Fellow of the American Medical Association; member American College of Surgeons; aged 59; died April 15.

**Mann, John A., M.D.**, Wellington, graduate of the Missouri Medical College, St. Louis, 1876; honor member of the Lafayette County Medical Society; retired; aged 89; died April 20.

**Shelton, Mitchell C., M.D.**, Joplin, graduate of the Barnes Medical College, St. Louis, 1894; honor member of the Jasper County Medical Society; retired; aged 73; died April 24.

**Flynt, Joseph F., M.D.**, Paris, graduate of the Marion-Sims College of Medicine, St. Louis, 1892, and Missouri Medical College, St. Louis, 1899; member of the Randolph-Monroe County Medical Society; aged 72; died May 3.

**Mardorf, William C., M.D.**, St. Louis, graduate of Washington University School of Medicine, 1888; honor member of the St. Louis Medical Society; Affiliate Fellow of the American Medical Association; aged 73; died May 5.

**Hanser, Herman A., M.D.**, St. Louis, graduate of the Missouri Medical College, St. Louis, 1898; member of the St. Louis Medical Society; Fellow of the American Medical Association; member of the American College of Surgeons; aged 63; died May 28.

**Smith, Elsworth S., M.D.**, St. Louis, graduate of Washington University School of Medicine, 1887; honor member of the St. Louis Medical Society; Affiliate Fellow of the American Medical Association; member American Board of Internal Medicine; member American College of Physicians; Professor Emeritus of Clinical Medicine, Washington University School of Medicine; aged 76; died June 6.

**Bonham, Vaughan Q., M.D.**, Fayette, graduate of the University of Nashville Medical Department, 1877, and Vanderbilt University School of Medicine, Nashville, 1883; honor member of the Howard County Medical Society; aged 84; died June 23.

**Mayes, Joseph F., M.D.**, St. Louis, graduate of Washington University School of Medicine, 1904; member of the St. Louis Medical Society; Fellow of the American Medical Association; aged 63; died June 27.

**Haw, Uriel P., M.D.**, Benton, graduate of the Vanderbilt University Medical Department, Nashville, 1898; member of the Scott County Medical Society and secretary-treasurer of the Society since 1928; delegate to several Annual Sessions; Councilor of the former twenty-second Councilor District; former county health officer of Scott County; aged 67 years; was slain in a drug store at Benton on July 16 by a former inmate of a state mental institution at whose hearing Dr. Haw had been a witness.

## BOOKS FOR LEISURE MOMENTS

### SHULHAN 'ARUK

"The Kosher Code of the Orthodox Jew" (University of Minnesota Press, Minneapolis) has been translated into a modern language for the second time, into English for the first time. The translation is by S. I. Levin, the Senior Rabbi of Minneapolis, and Edward A. Boyden, Professor of Anatomy at the University of Minnesota.

In reality the code is a composite made up of an original text with continuous additions and comments by students of succeeding generations. It deals in minute detail with the normal and pathologic anatomy of animals slaughtered for consumption by the Jews. If the minutiae seem trivial, it must be remembered that they probably helped the survival of the race. On the other hand, they seem so arranged that a really clever butcher could prove as Kosher almost any killed animal. This volume will be useful especially to the student but it will interest any reader who would marvel at the anatomical knowledge possessed by these ancient peoples.

B. Y. G.

### LUES VENEREA

"Unto the Fourth Generation" (E. P. Dutton, New York) by Dr. Irving Simons is an informative account of the venereal diseases, intended for the layman. The author pleads that these diseases be looked upon as an infection rather than as the wages of sin. He presents the facts simply and does not moralize. He is concerned that the layman become aware of the facts that he may obtain treatment at the earliest moment. He explains, possibly more fully than some other authors, the function of the laboratory tests useful as diagnostic adjuncts. The black and white illustrations of Dr. M. Emanuel deserve more than passing notice.

B. Y. G.

### ALEXIS, BEAUMONT AND LEE

Ralph Cannon has reproduced the stately formalism of frontier life in St. Louis a hundred years ago with remarkable fidelity in his engrossing historical novel, "Lee on the Levee" (Saravan House, New York). Concerned primarily with the development of that system of hydraulic engineering which preserved the economic self-sufficiency of the 16,000 St. Louisians of 1838, the story includes a vivid portrayal of Dr. William Beaumont and Alexis St. Martin.

The mighty Mississippi was piling up so much silt in front of the St. Louis wharf that speculators believed what is now East St. Louis would assume preeminence and take from St. Louis the commercial importance which that city was achieving slowly. Indeed, had it not been for the mechanical ingenuity of Lieutenant Robert E. Lee the probability would have become a reality. So sound were the ideas of the young engineer that they have been incorporated in many of the projects to keep the Mississippi within a course that would make it of navigable importance.

B. Y. G.

## IF YOU ARE GOING TO SPEAK

If you are going to make a speech you should read "Stage Fright and What To Do About It" (Expression Company—Publishers, Boston) by D. W. Watkins and H. M. Kareo. For even to an experienced actor or speaker the most fearful experience is the awful moment in the beginning of his performance. Great artists rarely get over it even after a lifetime of successes. But calm assurance derived from familiarity with the subject, fearlessness as to any mistakes that may be made and earnestness of purpose will combine to minimize the state of mind known as stage fright.

B. Y. G.

## SOCIO-ECONOMIC INVENTORY

A series of eleven volumes on "Science in Modern Living" is now in preparation (Bureau of Publications, Teachers College of Columbia University, New York). They are concerned with the forces that determine the socio-economic status of man. The first three volumes, now published, provide a fascinating and informative account of the myriad factors that combine to make the structure of man.

Paul B. Sears, Professor of Botany at Oberlin College, discusses "Life and Environment." Environment is determined by the lithosphere, hydrosphere and atmosphere as much as it is by the interactions of man upon man. A somewhat fanciful account of the variety of forces that unite to establish a passing phase is afforded by the following quotation: "The famous relationship between the number of elderly spinsters in England and the prosperity of agriculture in Australia is a case in point. Australia depended upon the purchase of English-grown clover seed at a reasonable price to grow the legume necessary for nitrogen fixation and soil fertility. Clover sets seed only when pollinated by bumblebees. The bees' nests are robbed by field mice. Cats kill field mice and lonely ladies cherish cats. . . ." So the quality of Australian beef derives from the existence of hordes of cats dear to English spinsters.

That the development of prime beef does not follow so simple a sequence is readily apparent. A variety of animal pests, varying in size from a bacterium up, are constantly at hand, ready to intrude themselves upon the orderly processes of man. "The Control of Organisms" by Frederick L. Fitzpatrick, Professor of Natural History at the Teachers College, constitutes a logical second volume in the series.

"The Storehouse of Civilization," the most imposing volume of the present series, is an exhaustive survey of the natural resources of the world and the use to which man has put them. C. C. Furnas, Associate Professor of Chemical Engineering at Yale University, pays high tribute to the persistence of man in seeking out the storehouses of nature and to his inventive genius in utilizing those materials in so many ways. But he sounds a note of warning that the natural storehouses are being depleted ruthlessly. While better methods would preserve these resources for posterity, research is constantly disclosing new sources of material goods.

Perhaps the most significant portion of Professor Furnas' contribution deals with the effect of technology upon man himself. It has completely altered his mode of living. It has shortened the working week, provided leisure and given him the means of general education. But unless the mass acquires an interest in genuine education, the author points out, the struggle of democracy will become even more rocky than it is. The competition between that and communism will become increasingly greater. Indeed, it is social concern which motivates this new "Science in Modern Living" series and that should insure its wide circulation, even study.

B. Y. G.

## PLIOFILM AIDS WET DRESSINGS

The difficulties of maintaining continuous wet dressings on the hands or feet in certain skin diseases are overcome by the use of mitts and socks made of a material called pliofilm, Garold V. Stryker, M.D., and Joseph Grindon, Jr., M.D., St. Louis, report in *The Journal of the American Medical Association* for July 13.

"This material," they say, "is moisture proof, oil proof, odorless, nonirritating, pliable, thin, durable, tear resistant, sewable, heat sealing, not uncomfortably warm (as are rubber mitts and socks), noninflammable, resistant to weak acid and alkali and inexpensive.

"Although rubber gloves and socks are effective for the purpose, patients object because of constriction and excess heat.

"In order to insure comfort the pliofilm coverings should be large enough to cover the dressings and at the same time permit some movement of the fingers and toes. To prevent drying, they must come in contact with the skin of the wrist or ankle above the dressings."

## IMPLANTS FROM LINING OF WOMB

Two women complaining of what they thought was "stomach trouble" were found to have obstructions of the small intestine caused by a growth of an escaped portion of the mucous membrane lining the womb, Paul M. Glenn, M.D., and John J. Thornton, M.D., Cleveland, report in *The Journal of the American Medical Association* for August 17.

The escape of a portion of the mucous membrane lining of the womb from its normal location and its adhesion to and growth on some other organ of the abdomen is known as endometriosis and is not an uncommon condition. Just how this condition arises has not been determined. The two Cleveland men report their two cases, they say, because the finding of the small intestine being involved in such a condition apparently is rare. Surgical removal of the implant and the portion of the small intestine to which it was attached resulted in recovery.

## TREATMENT OF BARBITURATE POISONING

Evacuation of the stomach and artificial respiration with inhalation of oxygen in case of difficult breathing should be instituted in patients who are in coma from barbiturate poisoning, it is pointed out in *The Journal of the American Medical Association* for August 17. The article is one of a series on treatment prepared by members of the attending staff of the Cook County Hospital, Chicago, and edited by the late Bernard Fantus, M.D. Dr. Richard Kohn Richards collaborated in the preparation of the barbiturate article.

Pointing out that the mortality rate from barbiturate poisoning may exceed 20 per cent, the article states that symptoms of poisoning generally continue for several days before death or recovery takes place. When the patient is admitted to the hospital in the stage of coma, evacuation of the stomach should first be performed, with the patient's head lower than the stomach. Enemas may be required, and these may consist of hot strong black coffee. Postural drainage should be maintained by elevating the foot end of the bed to tilt the bed from 15 to 20 degrees, the patient's feet being tied to the end of the bed if necessary and his head turned to the side. Secretions accumulating in the pharynx should be removed by suction. Feeding should be done through a stomach tube and should always be preceded by evacuation of the stomach's contents.

An important part of the treatment consists of liberal administration of stimulating drugs to counteract the depressant action of the barbiturates on the central nervous system. Picrotoxin and metrazol may be used for this purpose.



## COUNCILOR DISTRICT AND SOCIETY PROCEEDINGS

ASSOCIATE EDITORS: COUNCILORS OF THE  
TEN COUNCILOR DISTRICTS

### COUNTY SOCIETY HONOR ROLL FOR 1940

(UNDER THIS HEAD WE LIST SOCIETIES WHICH HAVE  
PAID DUES FOR ALL THEIR MEMBERS)

#### HONOR ROLL

Chariton County Medical Society, December 5, 1939.

Perry County Medical Society, December 11, 1939.

Camden County Medical Society, December 18, 1939.

Miller County Medical Society, December 20, 1939.

Ste. Genevieve County Medical Society, December 22, 1939.

Clinton County Medical Society, December 23, 1939.

Moniteau County Medical Society, January 8, 1940.

Macon County Medical Society, January 10, 1940.

Dent County Medical Society, January 29, 1940.

Dallas-Hickory-Polk County Medical Society, February 15, 1940.

Barry County Medical Society, February 22, 1940.

Andrain County Medical Society, March 22, 1940.

Webster County Medical Society, March 25, 1940.

Morgan County Medical Society, April 8, 1940.

DeKalb County Medical Society, April 15, 1940.

Newton County Medical Society, April 15, 1940.

Howard County Medical Society, April 16, 1940.

Lincoln County Medical Society, April 26, 1940.

St. Francois-Iron-Madison-Washington-Reynolds County Medical Society, May 2, 1940.

Adair-Schuyler-Knox-Sullivan-Putnam County Medical Society, May 16, 1940.

Bates County Medical Society, May 21, 1940.

Holt County Medical Society, July 8, 1940.

Pulaski County Medical Society, July 8, 1940.

Franklin County Medical Society, July 9, 1940.

Christian County Medical Society, July 19, 1940.

### FIFTH COUNCILOR DISTRICT

W. A. BLOOM, FAYETTE, COUNCILOR

#### Cole County Medical Society

The Cole County Medical Society held a joint meeting with dentists and druggists of Jefferson City at a picnic barbecue on the Maries River on July 25. The meeting was in celebration of fifty years or more of service of four men of Cole County. Sixty physicians, druggists and dentists attended the meeting.

The four honored guests were Dr. W. W. Townley, Chamois; Dr. J. F. Jones, Linn; Dr. A. E. Hammen, Jefferson City, and Mr. Henry DeWyl, Jefferson City. Dr. Townley's father and grandfather were physicians. He has practiced medicine in Chamois, his only location, since 1879 and although 81 years old is still active in the profession. Dr. J. F. Jones is a son of a physician. He has practiced in Linn since 1889. Dr. A. E. Hammen has practiced dentistry in Jefferson City since 1888 and is still active in his profession. Mr. DeWyl is the son of a physician who practiced in Cole County and then founded the DeWyl Drug Store which Henry DeWyl now operates. He has been a druggist for fifty-three years.

Following a dinner, Dr. Irl B. Krause, president, introduced the toastmaster, Dr. James Stewart, who in turn introduced the four guests of honor. Each was presented a scroll signed by those present and each responded with a short talk.

JAMES A. HILL, M.D., Secretary.

### NINTH COUNCILOR DISTRICT

E. C. BOHRER, WEST PLAINS, COUNCILOR

#### Phelps-Crawford County Medical Society

The Phelps-Crawford County Medical Society met at Rolla on July 8 at the Nelle McFarland Memorial Hospital.

Dr. J. B. Jones, Rolla, was elected a member.

Drs. E. L. Hume, Bourbon, and S. L. Baysinger, Grand Tower, Illinois, were elected honor members.

Following a dinner Dr. U. J. Busiek, Springfield, spoke on "Immunization."

Dr. A. W. Gifford, Springfield, spoke on "Headaches."

Twenty-six members and guests were present.

R. E. BREUER, M.D., Secretary.

### TENTH COUNCILOR DISTRICT

E. J. NIENSTEDT, SIKESTON, COUNCILOR

#### Scott County Medical Society

The Scott County Medical Society met at Benton on July 23.

Dr. W. O. Finney, Chaffee, was elected secretary to fill the vacancy caused by the death of Dr. U. P. Haw, Benton, for many years secretary of the Society.

Dr. J. A. Cline, Oran, was elected a member.

The Farm Security Administration plan for medical care of its clients was presented and while favorably considered the matter was laid over until the next meeting.

The following resolution on the death of Dr. Haw was adopted as drafted by a committee consisting of Drs. G. W. Presnell, M. H. Kendig, J. A. Cline, H. L. Dunaway, G. A. Sample, G. T. Dorris and W. O. Finney.

WHEREAS, The Great Physician has suddenly called from our midst Dr. Uriel P. Hall, Benton, the secretary of our Society for many years, the son of a pioneer Southeast Missouri physician, who was murdered in the city drug store at Benton, July 16, 1940, be it

Resolved, That the Scott County Medical Society greatly

feels the loss of our colleague and mourns his untimely death, be it further

*Resolved*, That the people of Scott County and many public institutions have lost a friend who cannot be replaced easily and who gave of his time and skill to people of all stations in life to soothe their ills, often without remuneration, and be it further

*Resolved*, That the Scott County Medical Society furnish a copy of this resolution to the family, a copy to be spread on the records of the Society and copies be furnished the Missouri State Medical Association and the papers in Scott County.

W. O. FINNEY, M.D., Secretary.

## BOOK REVIEWS

**NUTRITION AND PHYSICAL FITNESS.** By L. Jean Bogert, Ph.D., Formerly Instructor in Medicine, University of Chicago, etc. Third Edition Fully Revised and Reset. Philadelphia and London: W. B. Saunders Company. 1940. Price \$3.00.

This is a sound compendium of accurate information on nutrition unencumbered by bibliographic detail. The volume will prove especially useful to physicians who desire to keep abreast of current advances in the field without wading through the sometimes conflicting maze of conclusions formulated by each of several investigators. The volume is written so that the intelligent layman may understand it.

B. Y. G.

**MEDICAL MICROBIOLOGY.** By Kenneth L. Burdon, Ph.B., Sc.M., Ph.D., Assistant Professor of Immunology and Bacteriology, Louisiana State University School of Medicine, New Orleans; Senior Visiting Pathologist, Charity Hospital of Louisiana at New Orleans, etc. New York: The Macmillan Company. 1939. Price \$4.50.

When Burdon published his "Textbook of Bacteriology" a few years ago his style of writing met with such instantaneous favor that the book was used not only for student nurses for whom it was written but also by medical students who used it as a supplementary textbook and many physicians who desired to "brush up" on bacteriology. Most textbooks on bacteriology were dull reading but this was one which read almost as a novel.

This prompted Dr. Burdon to write a larger book for more advanced students. "Medical Microbiology" uses the same style as the earlier book but it contains a great deal more detail. It is interesting reading even for one without previous knowledge of medical subjects. The plan is methodical showing careful preparation over a number of years in teaching the course. The historical chapters are complete for a book of this type. The relationship of bacteriology to disease is stressed, aiding the medical student to bridge the gap between theory and practice. The book can be recommended highly.

H. C. A.

**CANCER IN CHILDHOOD and a Discussion of Certain Benign Tumors.** Edited by Harold W. Dargeon, M.D., F.A.A.P. Attending Pediatrician, Memorial Hospital for Cancer and Allied Diseases, New York; Associate Pediatrician, St. Luke's Hospital, New York, etc. Illustrated. St. Louis: The C. V. Mosby Company. 1940.

This new monograph under the editorship of Dargeon summarizes the experience of the staff of the Memorial Hospital for Cancer and Allied Diseases, New York, in the treatment of neoplasm in children.

The number of cases treated is comparatively small considering the size of the Memorial Hospital service, and it is evident that malignant tumors in childhood are relatively uncommon. The end results as cited in these

papers point to a bad prognosis for the child with cancer.

In general, radiation therapy seems to offer as good a result as surgery. It is to be noted, however, that radiation is more likely to lead to deformity in children than in adults. For example, in the radiation of an extremity there is apt to be shortening due to the injury of the growth center in the bone.

In regard to Wilms' tumor, Dr. Dean suggests that there is a 5 per cent five-year cure rate from surgery with preliminary radiation and, apparently on the basis of two cases, concludes that irradiation alone is a more satisfactory treatment.

In presenting this monograph from the experience of a large cancer service the authors have made a distinct contribution to medical literature. Further experience with some of these tumors will probably alter some of the methods used, but it seems likely that the prognosis of neoplastic disease in childhood will not be greatly changed.

B. S. P.

**HEADACHE AND HEAD PAINS. A Ready Reference Manual for Physicians.** By Walton Forest Dutton, M.D., Formerly Medical Director, Polyclinic and Medico-Chirurgical Hospitals Graduate School of Medicine, University of Pennsylvania; Visiting Physician to the Northwest Texas Hospital, etc. Philadelphia: F. A. Davis Company. 1939. Price \$4.50.

Dr. Dutton not only has written an exhaustive treatise on headache but has included almost every known disease in which headache may be a secondary factor.

The book resembles a pocket edition on general medicine with headache as the principal theme more than a monograph on headache from a physiological-pathological standpoint.

Some twelve pages of the book are consumed with a description and technic of enemata which, considering the secondary character of therapeutic value, seems to be more than ample.

There is a great deal of repetition on drug therapy. Some of the prescriptions apparently are included because of their antiquity rather than physiological application.

The alphabetical arrangement of the subject matter simplifies its use. On the whole, this volume is exactly what it purports to be, a "Ready Reference Manual."

H. R.

**SHOCK BLOOD STUDIES AS A GUIDE TO THERAPY.** By John Scudder, M.D., Med.Sc., F.A.C.S. From the Surgical Pathology Laboratory of the College of Physicians and Surgeons, Columbia University, and the Department of Surgery, the Presbyterian Hospital, New York City. Fifty-five illustrations. Five plates, three of which are in color. Philadelphia: J. B. Lippincott Company. 1940.

This volume presents the subject of shock and its various phases in a concise and clear-cut manner, more so probably than has ever been done in a single volume. The author has done extensive clinical and laboratory work in compiling data from which he draws the facts to present in this book.

With the rapid mechanical developments in industry and living conditions, producing extensive injuries, and surgical operations increasing in their scope, every physician, whether surgeon or not, should familiarize himself with the subject of shock, its early diagnosis and treatment.

The author brings to light a new apparatus for measuring specific gravity of body fluids within a very few minutes, by computing the time required for a drop of fluid to fall a definite distance through a solution of known specific gravity.

This seems a relatively simple procedure to a man who spends his time in this field but with physicians in



general who must keep ten thousand other things in mind the use of this apparatus would be impractical in the majority of cases. If a more simplified apparatus for determining the specific gravity of the body fluids could be devised it would be a wonderful adjunct to medicine.

The volume is excellently composed with a blank page at the end of each section for personal notes; an excellent idea that could be used to advantage in all medical books.

The references are innumerable. If the volume was rewritten with the exclusion of references and historical data, it would make an excellent handbook that would be invaluable in every case of burn, trauma, hemorrhage and postoperative care as each produces a different type of shock which must be treated in a specific manner.

L. W. B.

**A TEXTBOOK OF PATHOLOGY.** By W. G. MacCallum, Professor of Pathology and Bacteriology, The Johns Hopkins University, Baltimore. Seventh Edition, Thoroughly Revised. Philadelphia and London: W. B. Saunders Company. 1940. Price \$10.00.

About twenty-five years ago, so the story goes, Dr. MacCallum took a vacation in the South Sea Islands and on the trip whiled away his time writing a textbook of pathology. He broke away from the old Zeigler tradition of dividing pathology as a text into general and special and based his book on the assumption that all pathological disturbances are the result of some form of injury or of the immediate or more remote reactions of the body to injury.

The book was designed as a text for teachers of pathology and in no sense as a book of reference as was, for example, Kaufmann's solid work. That the book was seized upon by the majority of teachers of pathology in this country is proved by the fact that in twenty-four years it has continuously gone on until it has reached its new seventh edition and has grown from a volume of 1,085 pages to one of 1,302 pages. It is interesting to note that the original conception of the presentation of the subject of pathology has not been changed. The chapter headings remain the same.

It is a tribute to the author that the fundamental principles of pathology remain as originally written. The growth of the text has been due to the many advances in medicine during the last quarter century which have led to greater knowledge of the causes of bodily injury and functional disturbance that can be brought about in human tissue. These advances have been brought up to the minute and there can be no doubt that MacCallum will remain for the pathologist all that Osler is for the physician.

R. L. T.

**THE NEW INTERNATIONAL CLINICS.** Original Contributions; Clinics; and Evaluated Reviews of Current Advances in the Medical Arts. Edited by George Morris Piersol, M.D., Professor of Medicine, Graduate School of Medicine, University of Pennsylvania, Philadelphia. Volume II. New Series Two. Philadelphia, Montreal, New York: J. B. Lippincott Company. 1939.

The contents consist of original contributions, clinics and evaluated reviews of current advances in the medical arts. Outstanding contributions include: "Pellagra" by J. H. Musser, "Diabetic Arteriosclerosis" by Russell M. Wilder, "The Choice of Methods for the Correction of Anemia" by M. M. Wintrobe, "Functions of the Pituitary Gland" by G. K. Wharton and "Treating Stomach Complaints According to the Golden Rule" by Arthur E. Hertzler.

Dr. Wintrobe, in his article, "The Choice and Method for the Correction of Anemia" points out that it is not unusual to encounter patients with anemia who have

been treated inefficiently, inadequately or incorrectly, and with little effort having been put forth to determine the cause or attempt to establish exact diagnosis. He deplores the promotion of "shotgun" remedies, even by pharmaceutical houses of good repute.

It is stressed that anemia is a symptom and not a disease. The outstanding achievement in hematology during recent years has been the demonstration that there are two types of anemia which are symptomatic of nutritional deficiency and that these anemias can be successfully treated by correction of the deficiency. One type of deficiency is due to lack of a substance present in the liver and another due to lack of iron.

A clinical classification of anemias is presented and discussed. Therapy is divided into nonspecific measures and specific methods of treatment. Among the former are transfusion, diet, irradiation (for anemia of leukemia), arsenic and splenectomy. Specific measures include liver and stomach preparations, iron, thyroid extract and vitamin C.

Methods of clinical and laboratory examination conclude this splendid and timely article.

F. S. M.

**INTRODUCTION TO MEDICINE.** By Don C. Sutton, M.S., M.D., Associate Professor of Medicine, Northwestern University School of Medicine, Attending Physician, Medical Division of the Cook County Hospital, Chicago, etc. With Introduction by Ada Belle McCleery, R.N., Superintendent Evanston Hospital, Evanston, Illinois. With 144 Text Illustrations and 14 Color Plates. St. Louis: The C. V. Mosby Company. 1940. Price \$3.25.

This book written primarily for use in schools of nursing is necessarily presented from a point of view different from that of textbooks used in schools of medicine.

Part one is presented with the idea of giving the student nurse a brief summary of the fundamental background of medicine, including social and environmental influence on disease. One chapter is devoted to laboratory tests with special attention to the role of the nurse in the preparation of the patient for the various tests and in the collection of specimens.

Part two is a discussion of the various diseases, covering symptoms, diagnosis and treatment with a minimum of detail. Treatment stresses the nurses' relation to such care. The diseases described include those required by the Committee on Curriculum of the National League on Nursing Education.

R. V. P.

**CLINICAL HEART DISEASE.** By Samuel A. Levine, M.D., F.A.C.P. Assistant Professor of Medicine, Harvard Medical School; Senior Associate in Medicine, Peter Bent Brigham Hospital, Boston, etc. Second Edition, Revised and Reset. Philadelphia and London: W. B. Saunders Company. 1940. Price \$6.00.

The enthusiastic reception and quiet elevation of the first edition of "Clinical Heart Disease" to the front rank of authoritative and valuable treatises on cardiology was proof of its value to student and practitioner. Now after four years comes the first revision.

As the author states in the preface to the new edition, "no great or fundamental advances in cardiology have taken place." There are about fifty pages added to the old material which has for the most part been left intact. Here and there are added sentences and minor corrections.

The standardization of the fourth lead by the American and British committees made necessary a revision of all the cardiographic material dealing with this lead. Levine advocates 4 F, the 3rd lead or left leg electrode over the apex and either one of the other electrodes on the left leg using either Lead II or III according to the

indifferent electrode. He does not go into much of a discussion of the use of other chest leads except to mention them as sometimes helpful. Graphs made using the new method have replaced the older illustrations and more graphs have been used. About one fourth of the book is devoted to electrocardiography. The student and practitioner beginning the use of the cardiograph needs little more text than this section.

Sulfanilamide has had much use in the treatment of endocarditis, rheumatic fever and other diseases. Levine briefly mentions this drug and the results obtained. There is a new section on "The Mechanism of Congestive Failure," the emphasis being placed on the clinical application of the physiological data. An entirely new chapter entitled, "Medical-Legal Aspects of Heart Disease," has been added. Levine offers some good advice, almost preaches a sermon, and in the few pages brings up many of the medical problems which have been produced by our present day economic life.

The older edition is not outmoded. It has been added to. Those who have liked the first edition will want the new one and students or those who are beginning cardiology will do well to include this volume in their "must haves."

H. L. M.

**NEOPLASTIC DISEASES. A Treatise on Tumors.** By James Ewing, A.M., M.D., Sc.D., LL.D., Professor of Oncology at Cornell University Medical College, New York City; Consulting Pathologist, Memorial Hospital. Fourth Edition. Revised and Enlarged. With 581 Illustrations. Philadelphia and London: W. B. Saunders Company. 1940. Price \$14.00.

This book appears twelve years after the last edition. It has been well modernized and brought up to date. This edition is only fifty pages larger than the last, but the greater part of the expansion has been made at the expense of material which is of less interest now than it was twelve years ago.

For the last twenty years Ewing's "Neoplastic Diseases" has been the outstanding authority in English on the pathology of tumors and it has no near competitors. This book will be eagerly received by pathologists and those especially interested in tumors.

D. J. S.

**LEGAL GUIDE FOR AMERICAN HOSPITALS.** By Emanuel Hayt, LL.B., and Lillian R. Hayt, M.A., J.D., of the New York Bar. Prepared in collaboration with the Council on Government Relations of the American Hospital Association. New York: Hospital Textbook Company. 1940.

This volume is designed to provide the hospital field with a practical guide and text on the legal aspects of hospital administration. It is written in language entirely understandable by all persons connected with hospital administration with technical legal terms and phraseology reduced to a minimum. Each statement, however, has been authenticated by court citation or statute. While intended primarily for hospital administrators, the text may likewise prove of value to hospital attorneys, government officials and organizations and individual physicians and medical students who come in contact with hospital work.

The book was encouraged by the Council on Government Relations of the American Hospital Association and credit is given for the able guidance and assistance of the Council and its chairman, Dr. Claude W. Munger.

There are twenty-seven chapters dividing the subject matter into conveniently used material. Among material especially valuable is included hospital organization and management, the medical staff in relation to malpractice, nursing law, responsibilities of interns, labor relations and the law, workmen's compensation, hospital liens, hospital insurance and malpractice insur-

ance. Digests of various state laws relating to the incorporation of hospitals are given. Statutes applicable to the various topics and citations of decisions which control the various problems developed are given on the page on which the reference is made together with additional bibliography. The book therefore is an authoritative treatise on the subject.

The book fills a need for knowledge of the position, rights and responsibilities of the hospital which the changing attitudes toward social problems have caused.

**CLINICAL ROENTGENOLOGY OF THE ALIMENTARY TRACT.** By Jacob Buckstein, M.D., Visiting Roentgenologist (Alimentary Tract Division), Bellevue Hospital, New York City; Consultant in Gastro-Enterology, Central Islip Hospital. With 525 Original Illustrations. Philadelphia and London: W. B. Saunders Company. 1940. Price \$10.00.

This book is a worthy successor to Carman's classic of twenty-five years ago. It shows the effect of the succeeding generation in the application of clinical medicine to the roentgen shadows of the opaquely filled gastrointestinal tract. The book records the transition of the film reader into a clinical radiologist.

The historical development of alimentary roentgenology provides a fascinating first chapter. All through the book there is a proper recognition of proper priority personalities. One might accord more space to Holzknecht and his tremendous influence through his exposition of the fundamentals. The American, Hulst, is completely overlooked. These are insignificant items, however. The book is complete in clinical phases. Illustrative case histories are brief, yet ample. The author has avoided the temptation to include too many illustrations. There are 525 of them and each one makes its point clear, and they do not burden the book. One is hardly conscious of such a large number. It is doubtful if less would be possible and escape criticism.

This book should serve anyone who is seeking a reliable exposition of the clinical roentgenology of the alimentary tract. Both its comprehensiveness and its direct brevity should serve the student. The spread of coverage serves the inquiring physician who possesses more roentgen ray apparatus than knowledge of roentgenology. The qualified radiologist finds the book excellent for review and the references are more than ample to direct him to the source material.

The author has grown in radiologic stature since his first large and ponderous volume upon "Duodenal Ulcer." Many new and original things must happen in alimentary roentgenology before another edition is necessary. Certainly, no student's or intern's library will be complete without this excellent book.

E. H. S.

**OPERATIVE SURGERY.** By J. Shelton Horsley, M.D., LL.D., F.A.C.S., Attending Surgeon, St. Elizabeth's Hospital, Richmond, Va., and Isaac A. Bigger, M.D., Professor of Surgery, Medical College of Virginia, Surgeon-in-Chief, Medical College of Virginia Hospitals, Richmond, Va. With Contributions by C. C. Coleman, M.D., F.A.C.S.; Austin I. Dodson, M.D., F.A.C.S.; John S. Horsley, Jr., M.D.; Donald M. Faulkner, M.D. Volumes I and II. Illustrated by Helen Lorraine. Fifth Edition. St. Louis: The C. V. Mosby Company. 1940.

The new fifth edition of Horsley and Bigger's "Operative Surgery" continues the high standard of excellence set by its predecessors. The two volume arrangement of the fourth edition is retained, but there has been considerable revision of the text and much new material has been included.

It is well written and excellently illustrated and is one of the best texts extant on operative surgery.

B. S. P.



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### STUDIES IN BLOOD COAGULATION DISTURBANCES

HEYWORTH N. SANFORD, M.D.  
CHICAGO

The normal coagulation of shed blood protects the human race from a variety of accidents too numerous to mention. A deviation from normal coagulation, either completely or in part, causes a number of diseases that endanger the life of the individual. Inasmuch as these disturbances cause many unfortunate conditions in childhood, the so-called hemorrhagic diathesis, it is of interest to the pediatrician as well as the physiologist to attempt to enumerate some of the causes of this phenomenon.

Although the study of the normal coagulation of the blood has been carried on for more than a hundred years, the exact mechanism of this reaction is not known as yet. The end results of this reaction are understood; the soluble blood protein fibrinogen becomes the insoluble fibrin under the action of a substance known as thrombin. This is well understood, and the formation of more or less of this fibrin results in a firm or, as the case may be, unfirm clot. It also is fairly certain that the thrombin is formed from substances existing in the blood, namely, thromboplastin from the platelets and prothrombin from the blood serum, and that for the formation of thrombin calcium salts are necessary. How prothrombin is changed into thrombin, and where prothrombin comes from are still in doubt.

The so-called classical theory of Howell, which is a modification of an older theory by Morawitz, assumes that the thrombin is formed from substances existing in the circulating blood that are added to by disintegration of the platelets, the platelets breaking up into a cephalin-protein compound, called for convenience thromboplastin. To put this in a simpler way, the platelets add a substance which when added to the already existing prothrombin in the blood makes an overbalance that causes thrombin to be formed. Howell assumes

that this system is held in balance by a substance that he calls antithrombin. As yet this substance cannot be demonstrated but Howell has isolated a substance from the liver which he calls heparin. Clinically, heparin is a strong anticoagulant. Best has been able to dissolve artificially made clots of thrombosis in animals by the injection of this material. He has advocated this clinically as a means of reducing postoperative thrombosis and a wide field has been opened up.

However, while this is quite true, no one has been able to demonstrate heparin in circulating blood. Other theories of blood coagulation too numerous to mention deal mostly with the origin of prothrombin. There are, no doubt, two factors at work as Mills has shown rather conclusively that tissue juices may furnish considerable coagulation material or, as he calls it, tissue-fibrinogen. For the present, this phase of coagulation need not be considered. One can say, therefore, for the sake of clarity that there are certain known factors involved in blood coagulation that one can study, namely, fibrinogen, calcium, prothrombin and the blood platelets.

Let me discuss each of these known substances in order.

*Fibrinogen.*—Fibrinogen may be obtained from blood plasma from which the platelets have been removed by diluting the plasma with equal parts of normal salt solution. The amount of fibrinogen may then be estimated quantitatively by means of the Kjeldahl test. It is found in normal individuals to vary between 0.2 and 0.6 gms. It is increased normally in all instances of suppuration in the body. That it may have such wide variations normally has caused some workers to believe that it might be the cause of faulty coagulation. This belief was further strengthened by the fact that the amount of existing blood fibrinogen can be influenced slightly by the diet. Under this assumption the normal amount of circulating fibrinogen was assumed to be 0.5 gms. per 100 cc. and amounts below this, namely, 0.3 or 0.4 gms., indicated hemorrhagic tendencies.

This is a false assumption. In examination of the amount of fibrinogen in the blood of newborn infants during the first ten days of life, I have found

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From the Department of Pediatrics, Rush Medical College, University of Chicago.

that infants have average values of 0.35 to 0.45 gms. of fibrinogen per 100 cc. of blood, with normal variations of from minimal 0.25 gms. to maximal 0.7 gms. These are perfectly normal infants with normal coagulation values. Furthermore it has been shown that the concentration of fibrinogen necessary to initiate normal clotting is 0.07 gms. Obviously, therefore, the fibrinogen necessarily would be reduced far below reported values for hemorrhage to actually cause a clotting dysfunction. It can be assumed, therefore, that while fibrinogen can be manipulated slightly by diet it does not affect the clotting mechanism under any known conditions.

**Calcium.**—There is no question but that calcium is necessary as a factor in coagulation. Freshly shed blood may be kept from coagulating by precipitating or inactivating the calcium and, conversely, can be made to coagulate by the addition of calcium. That a diminution of calcium in sufficient quantity to hinder coagulation ever results *in vivo* is doubtful. The concentration of calcium necessary to cause coagulation of the blood has been found by Dr. Crane and myself to be 2.0 mg. per 100 cc. Normal blood calcium is approximately 10 to 13 mg. per 100 cc. Almost all workers agree that it is not diminished in hemorrhagic conditions. Furthermore, in infantile tetany the calcium falls to 5 or 6 mg. per 100 cc. and hemorrhage does not result. Therefore, if it is necessary to have a calcium concentration below 2 mg. per 100 cc. of blood before coagulation becomes delayed, before the child would show hemorrhage from a low calcium, tetany would develop.

**Prothrombin.**—The blood plasma contains a substance necessary for coagulation known as prothrombin. If a solution of washed platelets and calcium salts is added to a fibrinogen solution it will not clot. It will clot, however, if a little fresh blood serum is added to it. This shows that another factor must be present in the blood plasma to cause coagulation. This substance, or prothrombin, may be precipitated out of the plasma by tri-calcium phosphate and is found to be a protein associated with the serum protein globulin. It is presumed to be formed in the liver and vitamin K is necessary for its synthesis.

Clinically the prothrombin content of the blood may be determined indirectly by the method of Quick. This method estimates the clotting time of oxalated plasma after adding an excess of thromboplastin and a fixed amount of calcium. Therefore, if the coagulation of the blood is due to the interaction of calcium, thromboplastin and prothrombin on fibrinogen, and calcium and fibrinogen are fixed quantities, the excess of thromboplastin leaves only prothrombin as an unknown factor. The coagulation time of this blood must, therefore, be a measure of the prothrombin content.

There are numerous modifications of this method but Quick's method is simple and as good as any. Studies made on the prothrombin content of the blood show consistent levels. Quick estimates the

normal prothrombin level as that which causes the blood to clot in approximately twelve seconds. This usually is expressed in percentages and the percentage decreases with the lengthening of the coagulation time. It has been shown that the quantity of prothrombin existing in the blood is far in excess of that needed. Clinically, serious hemorrhage does not occur until the prothrombin falls below 20 per cent of normal values.

**Platelets.**—The last of the known coagulation factors are the platelets. The normal number of platelets existing in the circulating blood depends on the method of their enumeration. This usually is given as from 250,000 to 500,000. There must be a great margin of safety in these numbers of platelets because it is found that good clot formation will occur (except in instances which will be enumerated later) unless they fall below 100,000. Below this number clot formation is poor, and below 30,000 almost no clot will be formed at all. This is a quantitative platelet disturbance and is referred to clinically as thrombocytopenia.

The problem would be easy if one always could demonstrate a deficiency of platelets in all forms of blood coagulation disturbance. Unfortunately this cannot be done. However, there are a number of conditions in which the platelets are not reduced in number but show defects in resistance. Whether this is due to inherent differences in the platelets themselves or to some circulating anticoagulant is not known. These conditions are called qualitative platelet defects.

By the method devised by Dr. Leslie and myself, this qualitative defect may be studied by means of withdrawing the blood under oil at freezing temperature. This blood is rapidly centrifuged to throw the platelets out of the plasma. We can then study the coagulating time of various fractions of this platelet free plasma. Normal platelets will break up to some extent in spite of great care and coagulation will occur at a set time. Abnormal platelets that do not disintegrate, will, conversely, not clot the plasma in as short a time. By this method we may differentiate several conditions.

Lastly, there is a large group of hemorrhagic disturbances in which one cannot demonstrate any changes in any of the known coagulation factors. It is assumed that in these cases the blood coagulates properly but that there is an excessive permeability of the vascular endothelium of the small vessels that allows the blood to escape. A large number of this group of hemorrhagic disturbances have been found to be due to some form of allergy, and one group is caused by malnutrition, namely, a vitamin deficiency.

One may, therefore, on the basis of these findings classify hemorrhagic disturbances into the following classifications:

- I. Hemorrhagic conditions in which known coagulation factors can be demonstrated to be at fault.
  - A. Platelets.
    1. Quantitative.



- a. Interference with formation.
    - 1'. Tumors of the bones or marrow.
    - 2'. Anemias, aplastic and hemolytic.
    - 3'. Erythroblastosis.
  - b. Destruction.
    - 1'. Bacterial, streptococcus, staphylococcus, diphtheria, influenza, typhoid, tuberculosis and syphilis.
    - 2'. Chemical, benzol, arsenic, roentgen ray and radium.
  - c. Hereditary thrombocytopenia.
  - d. Essential thrombocytopenia.
  2. Qualitative.
    - a. Hemophilia.
    - b. Hemorrhagic disease of newborn. (This is questionable, as there may be a factor of prothrombin.)
    - c. Hereditary thromboasthenia.
  - B. Prothrombin.
    1. Lack of vitamin K.
      - a. Faulty absorption as obstructive jaundice, biliary fistula and sprue.
      - b. Dietary origin, absence of bacteria in intestines. (Hemorrhagic disease of newborn?)
    2. Liver damage, faulty utilization of vitamin K.
      - a. Post anesthesia, chloroform poisoning.
      - b. Acute yellow atrophy.
    3. Toxins, as sweet clover disease in cattle. Has not been demonstrated as present in man.
  - C. Fibrinogen (very doubtful). Liver damage coagulation disturbances are probably due more to a prothrombinemia than fibrinogen deficiency. Margin of safety is very high.
  - D. Calcium (very doubtful). Margin of safety is very high.
- II. Vascular purpura, or hemorrhagic conditions in which no known coagulation factor can be demonstrated to be at fault.
- A. Mechanical. Venous stasis, tumors, pertussis, bandages about extremities.
  - B. Malnutrition. As in avitaminosis. Best example vitamin C in scurvy.
  - C. Essential or anaphylactic purpuras.
    1. Purpura simplex (most common of all purpuras).
    2. Purpura rheumatica (Schonlein).
    3. Purpura abdominalis (Henoch).

It is presumed that the platelets are formed from the megakaryocytes of the bone marrow. One of the most common of quantitative conditions deals with an injury to the bone marrow or a destruction of platelets at their source. One of the most common causes of hemorrhagic disturbances of this type in children is the anemias. Any decrease in the red cells will be followed by a corresponding decrease in the platelets. This is particularly true with the leukemias in which terminal blood conditions almost always cause hemorrhages. The profound anemia resulting from erythroblastosis is fol-

lowed by hemorrhages. One never should make a diagnosis of thrombocytopenia in an individual with any other blood change such as an anemia, erythroblastosis or white blood cell changes. Also a characteristic blood finding that should make one beware of other blood changes is a low hematocrit.

Probably the most common cause of thrombocytopenia in children is the presence of a bacterial focus. Any organism may be the cause but the streptococcus is the most common offender. Here again one never should consider a thrombocytopenia until every sign of a bacterial focus is cleared up. After this is done, therapy for the blood may be considered; before this, it is just so much waste motion.

Hereditary thrombocytopenia is a condition that has come into attention only in the last few years. These individuals have an amazingly small number of platelets but these are very active. That is to say, they break up readily and keep coagulation well within safety limits unless there is some unusual stress on the system. Glanzman first called attention to this condition and noted a constitutional factor. In a child with hereditary thrombocytopenia that was autopsied by Greenwald and Sherman there were found to be definite changes in the bone marrow with a scarcity of megakaryocytes. I reported such a family in which the infant was born with purpuric spots that healed spontaneously. The child's platelet count at birth was 20,000 and rose to 137,000 by the tenth day. Its mother's blood was 17,500 on the fourth day and 10,000 on the tenth. The mother gave a history of frequent petechia but no gross hemorrhage. She said that she thought nothing of this as her mother often had such manifestations. Another such family has been found since with a number of isolated individuals. This will be discussed later. These people are in no danger unless there is some exceptional strain put on their coagulation system such as infection or hemorrhage. Normally their blood clots well because of rapid platelet disintegration or, as one might say, good quality. Their chief danger is in being diagnosed as essential thrombocytopenic and a splenectomy attempted. While only a few of these individuals have been reported, I am sure that it is a fairly common condition.

Essential thrombocytopenia is really not common but being spectacular is well known. It may appear at any age but manifests itself mostly in later childhood and at puberty. Females are affected more often than males. It is frequently preceded by an infection.

Clinically these patients do not present any peculiarities except the hemorrhagic condition which begins in the mucous membranes of the nose or mouth, particularly the gums. Skin manifestations almost always follow the mucous membrane hemorrhages. The parts of the body most often affected are those in which the skin is near a bony surface as the tibia, crest of the ilium and the skull, and it is usually the extensor surfaces. It is often stated that the spleen is enlarged but it is rarely palpable.

The blood always shows a decrease in platelets to about 30,000, and counts of 5,000 are not uncommon. The coagulation time of the blood is only slightly increased but the bleeding time is lengthened markedly and the clot retractibility is absent or incomplete. There must be also some vessel pathology because the pressure or Rumpel-Leede phenomenon will usually give minute hemorrhages.

Roughly, all cases of essential thrombocytopenia will follow three courses. First, by far the greater majority have their course over a few days or a week and recover spontaneously, never to have another attack. The second type is much less common; the patient recovers from his attack but has another in months or years and becomes chronic. This type may show a palpable spleen. The third and last type, and fortunately the rarest of all, continues with the hemorrhages in spite of all treatment until death.

There has been considerable discussion as to the cause of thrombocytopenic purpura. The two main theories are respectively that the bone marrow as represented by the megakaryocytes is defective, sponsored by Frank, and the second by Kanezelson that the platelets are destroyed by the endothelial cells, particularly the spleen. There is good evidence that both ideas are correct. Marrow taken from some individuals will show faulty megakaryocytes clearly. Trypan blue which blocks the endothelial cells will increase the platelet count when injected into an animal. Antiplatelet serum, or splenic extract from spleens of splenectomized individuals with thrombocytopenic purpura will cause a fall in platelets when injected into animals. I believe that both conditions may be causes and that our problem is to differentiate which one.

Remembering that the commonest manifestation of thrombocytopenia is one attack with recovery, I believe that for the first attack our approach should be conservative. The literature is full of treatments that have proved successful for this condition, probably because it is self-limiting. The best known treatments are diet, fresh air and vitamins, and these never hurt anyone and are obviously helpful. Other remedies are ultraviolet irradiation, roentgen radiation of the flat bones, glandular extracts and snake venom. None of these are particularly satisfactory and I believe that transfusions are the treatment of choice. Jones and Tocantins, who have had considerable experience with transfusions in this condition, recommend small ones of from 25 to 100 cc. at frequent intervals. If possible, I think it is better to give about 100 cc. to begin with and study the results on platelets and coagulation. Then as these fall, other transfusions may be given. If for any reason an intervenous transfusion cannot be given, it may be given intraperitoneally. Intramuscular blood is of doubtful value.

If the child responds to these, the platelets increase or at least the coagulation remains normal, one can commence building them up with diet. If after repeated transfusions the blood still falls back to low platelet values and poor coagulation, splen-

ectomy must be considered. This also applies to the chronic form which returns again and again. A bone marrow study should then be done. Usually a sternal puncture will be sufficient; if not a small piece of marrow can be removed from the sternum surgically. If the marrow is poor in cells, or if the megakaryocytes are few and poorly formed, the value of a splenectomy is doubtful. This refers more definitely to the type described by Frank and the pathology is in platelet formation, not in their destruction.

Recently roentgen ray therapy to the spleen has been revived and there is certainly no harm in trying this before a splenectomy. Splenectomy never should be attempted until the child is in good condition except in those cases of fulminating uncontrollable hemorrhage.

The only exception is in the congenital purpuras. Be careful to diagnose these. There is little change after a transfusion, only a small increase in amount of platelets and little decrease in plasma coagulation. Do not consider a splenectomy on these cases as it does absolutely no good, having no effect on the platelets.

Along these lines I would like to remark on some experiments done by Troland and Lee with a splenic extract from a child with essential thrombocytopenia in which the spleen was removed. When this extract was injected into rabbits, there was an extreme drop in platelets to below 50,000 which remained for thirty hours and then rapidly rose to normal. These experiments were repeated in our laboratory and found to be true. However, it was found that the same results could be obtained with splenic extract from a child in which the spleen was unfortunately removed for a congenital thrombocytopenia; also exactly the same results were obtained from extract of a normal spleen. It would appear, therefore, that there is some substance in normal splenic tissue that in large quantities is able to injure or at least suppress the platelets. At the present time we are studying the effects of small quantities of this substance which may stimulate the platelets. (This work has since been confirmed by Tollili and Pusic.)

In the hemorrhagic disturbances in which there is no decrease or quantitative change in the platelets, the platelets, normal in number, do not break up as they should but have a qualitative change. The member of this group that has been studied most is hemophilia. This is a relatively rare disease. It follows mendelian laws and is directly transmitted by daughters of hemophiliacs who, while they are not hemophiliacs, will bear sons who are. The excellent studies of Jones and Tocantins, and Birch, show that hemophiliacs tend to have large families, averaging 5.3 children, and the majority (69 per cent) of these are girls. Of the males 89 per cent are hemophiliacs.

As a rule the disease does not manifest itself before 2 years of age. It has been reported in the newborn but there is some doubt as to the diagnosis. Newborn infants of a hemophiliac inheritance



rarely exhibit the disease. The only symptom is bleeding, the individual being healthy except for an anemia if the hemorrhages have been extensive and frequent. Hemorrhage may occur spontaneously or follow slight trauma and may occur in every region of the body, the most frequent location being the nose and mouth. All hemophiliacs seem to have bad teeth, hence gums are a frequent point of bleeding. Another common point of bleeding is into a joint. At first this is absorbed, later immobility may result.

The blood shows a secondary anemia with normal platelet values. The bleeding time and capillary resistance tests are normal. The coagulation time shows wide variations. It changes in cycles and why coagulation will be normal at one time and fail at another is not known. The blood will coagulate normally and in two hours coagulation will fail to be complete. The pathology of this is well known. Normal platelets disintegrate rapidly after agglutination at the point of trauma. In the hemophilic agglutination occurs but disintegration is incomplete. If hemophilic blood is drawn under oil in a chilled syringe and placed in a chilled paraffin tube and centrifuged in ice, the resultant plasma that is free of observable platelets will not clot for hours, whereas normal plasma will clot in a standard number of minutes. If washed platelets from the blood of a normal person are added to hemophilic plasma, it clots promptly. Conversely, if the hemophilic platelets are added to normal platelet free plasma, they have little effect on it but if they are broken up mechanically, they will cause clotting at once both in normal plasma and in hemophilic plasma.

The pathology, therefore, is a qualitative platelet defect that exists at unknown intervals. Whether this is an inherent platelet defect or due to some circulating inhibitory substance is still a matter of argument. I would like to warn you against any operation on a hemophilic if the bleeding and coagulation times are normal by the usual methods. They are not safe to rely on. The method devised for qualitative platelet analysis that has been described by Dr. Leslie and myself will show changes in plasma coagulation before they are discernible by the ordinary methods. This is the centrifuging of the blood in ice, as mentioned previously.

As in thrombocytopenia, almost everything has been tried as a treatment of hemophilia. Its tendency to stop spontaneously makes many treatments appear good for a time, but anyone who has ever worked with these unfortunate individuals realizes that a thing that is good at one time has no effect at another. There is only one method of absolute control at the present time and that is transfusion. Whole blood given intravenously is best; given intramuscularly or serum seem to be useless. The amount depends on the case. For local bleeding, protein sensitization discovered by Vines and used by Eley and Clifford may be of value in bleeding from superficial injuries. Ovarian extract may be tried but has not been a success for me. Fre-

quently used local styptics are tannic acid powder, tissue fibrinogen and muscle tissue. These may be successful at one time and not at another.

Prophylactically, daughters of hemophiliacs should not marry. True, not all carry the disease but we have no means of knowing who does; so they should not reproduce. The general prognosis of hemophiliacs is unfavorable, 85 per cent dying in childhood. The earlier in life the condition begins, the more unfavorable the prognosis. The longer life continues, the greater the possibility of the hemorrhagic disposition disappearing.

The next condition that I believe due to a qualitative platelet deficiency is hemorrhagic disease of the newborn, although there may be also a prothrombin deficiency. This now has become a rather infrequent disease if the older statistics are correct. In our newborn service in the last ten years it has occurred three times in 8,500 newborns.

In these three cases of hemorrhagic disease of the newborn, observations were made on the blood from birth. It was perfectly normal for twenty-four hours in one case and for forty-eight hours in the other. At the end of these times coagulation time was greatly increased because of the inability of the platelets to disintegrate, a qualitative deficiency.

In the studies on the blood of the normal newborn, it is found that from birth to the fifth day there is a gradual increase in the resistance of the platelets and a corresponding decrease in the coagulation time of the blood, as shown by the plasma. There is little gross platelet change in number of platelets. This is a normal condition and after the fifth day it returns to normal. It would appear that in hemorrhagic disease of the newborn there is an exaggeration of this condition. The reason is not known.

The application of Quick's prothrombin method to the blood of the newborn shows, as has been known for many years, that the prothrombin content of the blood is low. Brinkhaus et al report that it is low throughout the first two weeks of life (40 per cent). Quick's results were different. He found the newborn's blood to be normal in prothrombin at birth, but low levels appeared almost at once on the first and second day to become normal by the third or fourth day of life. Kato and Poncher have obtained similar results. Unfortunately neither Quick or Brinkhaus have taken any necessary series of daily prothrombin values on the same infant but have simply estimated prothrombin values here and there throughout the newborn period on different babies for different days.

At the present time in our service daily prothrombin values on about thirty newborn infants, from the cord blood, through the tenth day of life have been estimated. The cord blood showed normal prothrombin values similar to the mothers'. However, the prothrombin value of the blood in the newborn falls slowly on the first day and more rapidly on the second and third. It continues low

on the fourth and fifth days, then rises rapidly from the sixth to the seventh day, and slowly decreases to normal by the tenth day of life. The curve resembles that by Rodda on the coagulation time of the newborn blood made by the capillary tube method on whole blood.

Some rather low prothrombin values (20 per cent or less) have been found during this period but there were no bleeding tendencies. We have been unable to find any lower prothrombin values in those newborn infants with cephalhematomas, vaginal bleeding or melena. One child with a mild hemorrhagic disease of the newborn showed prothrombin levels no lower than the normal group. The normal tendency in the newborn is for a low prothrombin value until the fifth or sixth day, then a rapid rise to normal whether vitamin K is given or not.

Clinically, hemorrhagic disease is not seen before the second day of life and rarely after the fifth. The local symptoms are bleeding from the cord, nose, mouth or bowel. Besides the anemia resulting, there are no other symptoms.

The blood shows an anemia with a slight leukocytosis. There is no change in the number of platelets. If the coagulation time is taken by the capillary pipette method it will be over ten minutes and the bleeding time by Dukes' method will be in proportion. There is no reason for doing elaborate prothrombin tests clinically as they will give similar results as the simple coagulation determinations. The prognosis is good, with treatment.

The prophylactic treatment of hemorrhagic disease of the newborn is at best doubtful. Almost no cases are seen at the present time in the better class of patients or in those in which the diet has been properly supervised; all one can say is that a well balanced diet for the mother, rich in vitamins, may be helpful. Lately it has been advocated that vitamin K should be given to the mother during late pregnancy. This can do no harm.

From the standpoint of the infant, I once advocated an early complementary feeding of high protein food. This is not necessary. For the last five years I have been giving no complementary feedings to the newborn at all, relying solely on the mother's milk, and have found no coagulation changes sufficient to cause hemorrhage. Some advocate giving blood intramuscularly at birth to all newborn infants, or at least premature infants or those experiencing a difficult delivery. This seems unnecessary inasmuch as the condition only happens once in 1,500 cases, and there is no evidence at all that there is any connection between cerebral hemorrhage and hemorrhagic disease of the newborn. Experiments have failed to show that injections of small quantities of parents' blood intramuscularly have any effect on coagulation. In fact both parents' blood, the mother's more than the father's, seemed to lengthen somewhat the coagulation time.

The active treatment consists of giving whole blood or blood serum immediately on diagnosis.

There is some evidence that blood from the mother is not as efficacious as blood taken from the father, or even a stranger. Blood should be of similar type and from 50 to 100 cc. given by direct transfusion. If this is not possible, an intraperitoneal injection of 50 cc. of whole blood or a similar amount of serum may be given subcutaneously or intramuscularly. Clinically, intramuscular blood has been used to a large extent because of its ease in giving, and it might be satisfactory in a mild case that would recover spontaneously. However, no one is the judge of whether a child is suffering from a mild case or a severe one. The treatment should tend, therefore, toward treating the infant as if it were suffering from a severe attack and an intravenous transfusion of from 50 to 100 cc. of whole blood given. Other coagulants are of such doubtful value and so inferior to whole blood as not to be worth considering. There is certainly no harm in giving vitamin K to these children but I would not rely on this treatment alone.

It must be understood in any discussion of hemorrhagic disease of the newborn that decreased coagulation tendencies in the newborn due to erythroblastosis (which is due no doubt to a depressed bone marrow, which in turn depresses the megakaryocytes, for there is always a thrombocytopenia) and hemorrhage due to sepsis and atresia of the bile ducts are not included in true hemorrhagic disease of the newborn. Bleeding in erythroblastosis promptly responds to transfusions. Bleeding in atresia of the bile ducts and sepsis does not always respond, probably due to a true prothrombin deficiency. This will be discussed later.

Before leaving the platelets, I would like to make some observations on an interesting subject that is not pediatric but may be of interest to the obstetrician. In making studies of the vitamin C content of the blood of women during labor, I found that during labor the blood platelets were decreased in all cases to 100,000 or below. There was no hemorrhagic tendency as shown by the majority of instances because the platelets had taken on a high or rather low qualitative ability. That is, they broke up so rapidly that coagulation was normal. The platelets rose rapidly to normal by the ninth day.

In one instance, however, during labor in a mother with 54,000 platelets, the coagulation time of both the normal and free plasma was increased, showing that her platelets were not functioning properly. This mother had considerably more bleeding than normal during the delivery and on the day following. Her platelets and coagulation functions were normal on the fifth day.

This makes one wonder if perhaps many of these women may be bordering on a state of coagulation dysfunction and if qualitative tests might not be a judge of whether or not a transfusion, or at least special care during the delivery, might not be indicated. It is interesting that these changes happen in that period in which postpartum hemorrhage is most frequent.



One may find a diminished prothrombin under several conditions. The first is a deficiency of vitamin K, which vitamin is essential for prothrombin formation. The most important condition in which this exists is faulty absorption. Vitamin K is absorbed in the intestinal tract in the presence of normal bile and is then utilized to synthesize prothrombin in the liver. It is present in ample quantities in the normal diet but it is not absorbed from the upper intestinal tract in which there is no bile. In obstructions of the biliary passages bile is prevented from entering the intestinal tract and vitamin K is not absorbed. The blood prothrombin drops to low levels and bleeding occurs readily. This has long been a clinical feature of obstructive jaundice. The margin of prothrombin in the blood is high and bleeding will not occur spontaneously unless the prothrombin falls to 10 per cent of normal. At 20 per cent the slightest trauma will initiate bleeding.

In an adult a prothrombinemia can occur in any form of biliary dysfunction and the best results from vitamin K therapy are obtained here. In the child there are only a few conditions that might cause disturbances in the prothrombin. These are congenital atresia of the bile ducts, sprue, chronic ulcerative colitis, intestinal fistulas and intestinal obstruction. In a newborn infant with congenital atresia of the bile ducts under my care there was spontaneous hemorrhage with a prothrombin level of less than 10 per cent. It has been advocated that all operations done on newborn infants during the first week of life should be preceded by prothrombin estimations. This is no doubt a good suggestion if possible, although clinically any extensive bleeding in the newborn following operation is seldom seen.

From a dietary standpoint, it has been shown that vitamin K is synthesized by bacteria within the intestines. It has, therefore, been suggested that since the newborn take little by mouth for the first days of life, its intestinal tract may not be infected by bacteria which at birth is sterile. With the establishment of intestinal flora, the synthesis of vitamin K begins and its absorption with the aid of bile raises the prothrombin. Prothrombin is related somewhat to the globulins of the blood. Colostrum, the first maternal supply of milk, is rich in globulin. Perhaps the fact that I send my newborns to breast at once and they obtain the colostrum at once may account for the rarity with which I find hemorrhagic disease as compared to others' findings.

Liver damage frequently will cause a lowering of the prothrombin in the blood. This has been shown both experimentally and clinically. Apparently prothrombin is manufactured in the liver. A damaged liver will lag so much in prothrombin formation that a diet sufficiently rich in vitamin K under normal conditions will prove inadequate. In the adult this is seen in acute yellow atrophy of the liver and in certain forms of cirrhosis. In the child one should suspect it in septicemia with liver dam-

age, in erythroblastosis and in various poisons that harm liver tissue.

The second large subdivision of purpuras are those in which one can demonstrate no changes in the blood coagulation mechanism. It is presumed that these are due to changes in the vascular endothelium and this can be demonstrated in some instances. This group is the largest of all the hemorrhagic disturbances but perhaps the most uninteresting because of their etiology.

A mechanical factor can be demonstrated in the purpura seen in pertussis and in venous stasis. These heal quite promptly when the causative factor is withdrawn. There is no doubt a definite dietary factor in some of these purpuras such as is seen in debilitated states as malnutrition, chronic diarrhea and avitaminosis. The hemorrhages of scurvy due to a deficiency of vitamin C have been known for years. The pathological condition existing in the capillaries is a disturbance of the cement substance between the endothelial cells. It is rather interesting to find that in estimating the blood vitamin C in many kinds of purpuras, the value will be considerably lower than in normal individuals. If the blood vitamin C is raised by the administration of cevitamic acid to normal values, the purpura and hemorrhages will still continue. It is, therefore, doubtful if, except in true scurvy, a deficiency of vitamin C ever causes hemorrhagic disturbances or administration of cevitamic acid ever will control the hemorrhagic condition.

However, whether low vitamin C values of the blood that are not low enough to cause a true scurvy but the so-called subclinical scurvy may under certain conditions cause definite disturbances enough in the capillaries to cause spontaneous bleeding is still open to more investigation. I do not wish at all, for example, to put forth the idea that a low blood vitamin C is a contributing factor in cerebral hemorrhage of the newborn. In eight consecutive cases of cerebral hemorrhage in the newborn the infant's blood vitamin C was found to be between 0.47 and 0.62 mg. which is considerably below the normal value. Could not a low blood vitamin C be a factor in the fragility of the cerebral capillaries if any extra strain was put on the system? It is a simple matter to control the concentration of the blood vitamin C in the newborn as it depends on the blood vitamin C of the mother, and this can be controlled by her vitamin C intake. The blood vitamin C of the mother can be tripled by an adequate citrus fruit intake, and this blood vitamin C may be imparted to her child.

Glanzman has attempted to classify three common types in this group of purpuras under the name of anaphylactoid purpuras. The first of the group and the one most frequently seen is purpura simplex. This comes on most frequently in the spring, in boys as frequently as girls, and usually in children under 10 years of age. There may be some systemic manifestation for a few days such as anorexia, headache or a slight fever. The purpuric manifestations begin suddenly and consist

of small purple spots on the extensor surfaces of the extremities. The trunk may be involved occasionally but rarely the face. Sometimes there is an edema of the extremities, or of individual spots, called purpura urticans, and occasionally urticaria and exudative erythema may develop. The prognosis is favorable. The duration is from one to three weeks. Remissions may occur some weeks or months after the first attack is over.

The second disease of this group is known as purpura rheumatica or Schonlein's purpura. The disease usually shows prodromal symptoms that are an exaggeration of purpura simplex. There is usually an associated sore throat. The purpuric condition is seen more often in the lower extremities, especially about the affected joint. It is much more frequently associated with urticaria. Edema frequently is seen and may involve the face and the eyelids. At about the same time as the eruption, the joints become painful and swollen. The knees and ankles most frequently are involved, usually multiple. The swelling is periarticular as well as from serous effusion into the joint itself. The prognosis is favorable. The duration is two weeks or more but there is a tendency to repeated attacks.

Lastly, there is purpura abdominalis or Henoch's purpura. In this condition the abdominal symptoms begin first and overshadow the skin manifestations. These are intense pain, anorexia and constipation followed by bloody stools, and occasionally nephritis and enlarged spleen. The single attack lasts only a day or so but usually is followed by others. The prognosis is good. In a 12 year old boy with this condition that I have followed for four years, attacks began at 3 years. To begin with they were at intervals of a month or so but have now lengthened to intervals of almost a year. The pain and bleeding were so severe in his fifth year that he was operated on for a gastric ulcer. Nothing was found in exploration. Frequently he will have only one or two purpuric spots following an attack. Recently he has had some urticaria. I have never been able to find a causative food factor.

It will be observed that there is considerable similarity between all these conditions. Clinically, each seems to be a progression or different grade of the other. Purpura simplex is seen in infancy while the rheumatic and abdominal types are less common in children than at puberty and in young adults. Probably no sex difference is found as American authors state males are most frequently affected and German authors that females are. Purpura simplex occasionally shows edema and urticaria; purpura rheumatica and abdominalis almost always do. In certain cases of purpura abdominalis, there seems to be an association with allergy. Alexander and Eyermann have found certain individuals in whom attacks were brought on by foods such as eggs.

There are no morphological or physiochemical changes in the blood. Platelets, coagulation time, bleeding time and retractibility of the clot are normal. The Rumpel-Leede's phenomena is usually

positive but may vary in the same patient. It is assumed by many authors that the pathology of the condition is an abnormal permeability of the blood vessels for which no pathological basis can be discovered. Frank considers the process to be due to a preliminary paralysis which causes colloidal changes in the vascular wall. He considers the hemorrhagic diathesis as unimportant inasmuch as the exudate of fluid occurs first and the hemorrhagic eruption follows.

Let us now come to the more practical applications of the problem of the diagnosis of hemorrhagic disturbance when one is confronted by such a condition. Roughly one can establish the condition as one or the other of the two main groups by a simple clinical test of the coagulation time of the blood. Rudolph's simple capillary tube method is easy and dependable. If in a capillary tube the blood coagulates in less than five minutes, the condition is probably in the second class of hemorrhagic disturbances or not due to a dysfunction of the blood clotting elements. If the coagulation time is more than five minutes, it is in group one, but it is not known which of the clotting elements is at fault. A platelet count will show the relative thromboplastic activity. With less than 100,000 there is a quantitative platelet dysfunction. If more than 100,000, it is a qualitative dysfunction of thromboplastin or a prothrombin deficiency.

The prothrombin should now be estimated by any of the current methods (Quick's is simple and as accurate as any). If the prothrombin is above 70 per cent and the coagulation time is increased, the dysfunction is a qualitative thromboplastic defect, as a hemophilia. If the prothrombin is below 30 per cent of normal, the dysfunction is due to a prothrombin defect. Calcium and fibrinogen are fixed quantities and never need be considered.

The method we employed in our laboratory offers a little more technical difficulty but is much more accurate. Two cc. of blood are drawn from a vein, being careful to avoid air bubbles and tissue fluids, into chilled oiled syringe and needle. One cc. of this blood is placed in a 1 cc. chilled paraffined tube and centrifuged for a minute and a half. This throws down the red cells but leaves the majority of the platelets in the supernatant plasma. The hematocrit is now read; a low hematocrit means a primary blood disturbance with probably a secondary thrombopenia such as an anemia, infection or leukemia. A drop of the plasma from the centrifuged tube is placed on a chilled counting chamber with a few grains of heparin and a platelet count made after fifteen minutes. Platelet counts of less than 100,000 are considered to indicate a thrombopenia or a quantitative platelet defect. Some of the plasma is drawn up in a capillary tube and the coagulation time of this plasma noted. A coagulation time of less than five minutes means a normal thromboplastic activity; if more than five minutes there is a deficiency of thromboplastic activity. The remaining plasma is again centrifuged in ice for fifteen minutes. This throws the platelets out of



the plasma and the coagulation time of this plasma in a capillary tube is a measure of the qualitative thromboplastic function. If this coagulation time is less than ten minutes, it indicates a qualitative thromboplastic defect. If the first tube coagulates in more than five minutes but the second tube coagulates in less than ten minutes, it indicates a deficiency in prothrombin. This can now be shown by estimating the prothrombin in the remaining 1 cc. of blood by the Quick method.

If no coagulation dysfunction is found, I would then advise a vitamin C determination. If this is normal, the hemorrhage will fall into one of the anaphylactic types of purpuras.

Naturally the treatment depends on the cause of the hemorrhagic condition. In group 1, thromboplastic defects of both types are helped by thromboplastin. To date the best source of thromboplastin is a blood transfusion. In children, I prefer a transfusion of from 5 to 10 cc. per pound body weight and repeated as necessary. No other thromboplastic agent can compare with whole blood or blood serum. Cases indicating splenectomy have been discussed. For a prothrombin deficiency, vitamin K is essential. This is best given orally. There are many preparations available. One of the first and one that I have had most experience with is a petroleum ether extract of alfalfa called Klotogen. This may be given to adults in dram doses several times a day. It should be given with bile salts. Small infants may be given 1 cc. doses or from 10 to 20 mg. of the synthetic vitamin. There does not seem to be any danger or ill effect from over-dosage.

Table 1. *Diagnosis and Treatment of Hemorrhagic Disturbances*

Method	Class of Disturbance	Treatment
Take bleeding and coagulation times.	If these times are lengthened it is a disturbance of coagulation function.  If these times are not lengthened it is a capillary or anaphylactic disturbance.	
Platelet count.	Over 100,000 is not a quantitative thromboplastic defect. Under 100,000 is qualitative thromboplastic defect.	Transfusion.  Splenectomy?
Prothrombin time.	If under 50% prothrombin is low. If under 30% is a prothrombin deficiency.	Vitamin K and bile salts.
Centrifuge blood and take coagulation time of plasma.	Low hematocrit means primary blood disturbance, as anemia, leukemia or infection.  Lengthened coagulation time with normal platelets and normal prothrombin is qualitative thromboplastic defect as hemophilia.	Treat primary cause.  Transfusion.
Vitamin C.	If below 50 mg. is preclinical scurvy.	Vitamin C.
If all of above are normal.	Capillary or anaphylactic disturbance.	Calcium. Adrenalin Desensitization.

Vitamin C can be given in the form of cevitic acid concentrate in from 25 to 50 mg. doses.

For the hemorrhagic conditions that do not show any disturbance of the coagulation elements, obviously, if one does not understand the cause of the pathological mechanism, the treatment is not conspicuously successful. It is well to remember before placing too much credence on any form of therapy that the condition is usually self-limiting. Rest in bed and a well balanced diet rich in vitamins is logical. Calcium in various forms is a somewhat standard therapy. Certainly it has no effect on the clotting mechanism but may have some effect on the vascular permeability. Desensitization on the basis of an anaphylactoid conception is justified if by elimination or skin tests a causative or sensitive factor can be found. It has seemed to me that injections of adrenalin shorten the attacks. On the whole, specific therapy does not as yet offer any great encouragement in treating these forms of purpura and one must await a causative factor, which will eventually be discovered.

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#### BIBLIOGRAPHY

- Abt, I.: *J. A. M. A.* **40**:284, 1903.  
Alexander, H. L., and Eyer mann, C. H.: *J. A. M. A.* **92**:1013, 1929.  
Best, C. H., and Solandt, D. Y.: *Lancet* **130** (July 16) 1938.  
Birch, C. L.: *J. A. M. A.* **99**:1566, 1932.  
Bonar, B. E.: *Am. J. Dis. Child.* **36**:225, 1928.  
Brill, N. E., and Rosenthal, N.: *Arch. Int. Med.* **32**:939, 1923.  
Brinkhaus, A., et al.: *Am. J. Med. Sc.* **196**:50, 1938.  
Clough, H. D.: *Diseases of Blood*, 1929.  
Cole, R. I.: *Bull. Johns Hopkins Hosp.* **18**:261, 1907.  
Cooley, T.: *J. Pediat.* **3**:929, 1933.  
Dam, H., and Schinheyder, F.: *Lancet* **1**:720, 1938.  
Eley, R. C., and Clifford, S. H.: *Am. J. Dis. Child.* **42**:1331, 1931.  
Ferguson, J. H.: *Am. J. Physiol.* **108**:670, 1934.  
Fonio, A.: *Cor. Bl. f. Schweiz. Aerzte.* **48**:1, 1915.  
Frank, E.: *Berl. klin. Wehnschr.* **52**:454, 1915.  
Gelston, C. F.: *Am. J. Dis. Child.* **22**:351, 1921.  
Glanzman, E.: *Jahrb. f. Kinderh.* **88**:1, 1918.  
Greaves, J. D.: *Am. J. Physiol.* **125**:429, 1939.  
Groh, M.: *Ztschr. f. Kinderh.* **46**:748, 1930.  
Greenwald, H. M., and Sherman, I.: *Am. J. Dis. Child.* **38**:1245, 1929.  
Guggenheim, A., and Wittgenstein, C.: *Pfaundler and Schlossman* **2**:257, 1934.  
Howell, W. H.: *Am. J. Physiol.* **78**:500, 1926.  
Herese, K.: *Arch. Int. Med.* **21**:565, 1918.  
Jones, H. W., and Tocantins, L. M.: *J. A. M. A.* **103**:1671, 1934.  
Kato, K., and Poncher, H.: *J. A. M. A.* **111**:749, 1940.  
Kanzelson, P.: *Wien. klin. Wehnschr.* **29**:1451, 1916.  
Klug, W. J.: *Deutsche Ztschr. f. Chir.* **199**:145, 1926.  
Kugelmass, I. N.: *J. A. M. A.* **101**:204, 1934.  
Lee, R. I., and Robertson, O. H.: *J. Med. Res.* **33**:323, 1915.  
Leschke, E., and Wittkower, E.: *Ztschr. f. Kinderh.* **102**:648, 1926.  
Macklin, M. T.: *Am. J. Med. Sc.* **175**:218, 1928.  
McLean, S.: *J. A. M. A.* **98**:387, 1932.  
Payr, R. L.: *Internat. Digest.* **6**:74, 1928.  
Phillips, R. A., Robertson, D. F., and Irwin, G. F.: *Am. Int. Med.* **4**:1134, 1921.  
Quick, A. J.: *J. A. M. A.* **110**:1658, 1938.  
Quick, A. J., et al.: *Am. J. Med. Sc.* **190**:501, 1935.  
Rodda, R. D.: *Am. J. Dis. Child.* **19**:269, 1920.  
Schloss, O., and Cominsky, A.: *Am. J. Dis. Child.* **1**:226, 1911.  
Sanford, H. N., and Leslie, E. I.: *J. Pediat.* **12**:16, 1938.  
Sooy, J. W., and Moise, T. S.: *J. A. M. A.* **87**:94, 1926.  
Snell, et al.: *Am. J. Digest Dis. & Nutrition* **5**:590, 1938.  
Stewart, G. N., and Zucker, T. S.: *J. Exper. Med.* **17**:152, 1913.  
Taylor, K. P. A.: *Am. J. Surg.* **21**:285, 1933.  
Troland, C. E., and Lee, F. C.: *J. A. M. A.* **111**:221 (July 16) 1938.  
Tyson, R. N.: *J. A. M. A.* **98**:393, 1932.  
Torrioli, Mario, and Puddu, Vittorio: *J. A. M. A.* **111**:1435, 1938.  
Vines, H. W.: *Quart. J. Med.* **13**:257, 1920.  
Waddel, W. W., et al.: *Proc. Soc. Exper. Biol. & Med.* **40**:432, 1939.  
Warner, E. D., et al.: *Am. J. Physiol.* **114**:667, 1936.  
Whipple, A. O.: *Surg. Gynec. & Obst.* **42**:329, 1926.

## FUNCTIONAL MENSTRUAL DISTURBANCES

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Functional menstrual disturbances, which are by definition unassociated with definitely determinable disease of the pelvic organs, are largely of endocrine origin. Their reasonable treatment demands a knowledge of the physiology of normal menstruation and of the probable action of the endocrine products available for therapeutic use.

It commonly is stated that the anterior portion of the pituitary gland is the motor of the genital apparatus, although such a statement is not completely true in view of the proved gonadotropic activity of the adrenals and the response of the pituitary to other hormones. However, the effect of certain pituitary secretions upon the gonads is well established and appears to be direct. The anterior pituitary gonadotropic hormones (prolans A and B) evidently act upon the ovaries only, but, by stimulating hormone production in those organs, affect the other portions of the genital apparatus indirectly. Prolan A stimulates development of the ovarian follicles which in turn produce the estrogenic hormone, estradiol; while prolan B promotes luteinization of the follicle cells remaining after ovulation, which then produce the corpus luteum hormone, progesterone.

These two hormones, estradiol and progesterone, have specific effects which are in part antagonistic and in part complementary. Estradiol, the hormone present in the ovarian follicles, stimulates growth and muscular activity of the other portions of the tract (uterus, tubes and vagina) and encourages proliferative growth of the endometrium; but apparently inhibits the production of prolan A by the anterior pituitary and is the antagonist of progesterone in its action upon the muscular portions of the tract. Progesterone, produced by the lutein cells, induces atrophy and loss of muscular activity in the uterus, tubes and vaginal mucosa and stimulates the development of the secretory, progestational phase in the endometrium which has been prepared by the estradiol action; but inhibits the prepituitary formation of prolan B and antagonizes the stimulating action of estradiol.

Menstruation depends upon the interaction of the two ovarian hormones which must be balanced accurately if the phenomenon is to be normal. The endometrium first is stimulated to proliferative growth by the estradiol produced by the developing follicle. Following ovulation, which usually occurs approximately fourteen days before the next menstrual period, the resultant corpus luteum provides the progesterone which quickly converts the proliferated uterine mucosa into the progestational

endometrium. The corpus luteum survives for only about fourteen days, unless conception occurs, in which case its function is continued under the influence of a gonadotropic hormone produced by the chorionic villi. In the absence of pregnancy, the atrophy of the corpus luteum produces a deficiency of estradiol and progesterone or of progesterone, which leads to menstrual bleeding and more or less destruction of the progestational endometrium. Some authors postulate a special "bleeding hormone" to explain menstrual bleeding, but the consensus favors the withdrawal of the action of one of the recognized ovarian secretions as the compelling factor.

Although true menstruation can appear only following ovulation with the subsequent development of a progestational endometrium, it is recognized that cyclic uterine bleeding may occur in the absence of progesterone stimulation. Such pseudomenstruation, which may develop from a proliferative type uterine mucosa, can be recognized only by endometrial biopsy performed in the few days just preceding the next expected flow. Under normal conditions curettage specimens obtained at this time show a secretory endometrium, whereas in pseudomenstruation there is no evidence of the corpus luteum effect.

The synthetic or natural gland products available for therapy include:

1. *Anterior Pituitary Extract*.—Hormones obtained from the prepituitary glands of animals are available but are expensive and have been used very little. The active substance invariably is associated with protein which many think is an integral part of the hormone molecule. Available preparations are poorly standardized and the presence of protein apparently invites untoward and annoying reactions.

2. *Anterior Pituitary-Like (A. P. L.) Hormones*.—Certain hormones obtained from the urine of pregnant women and from the serum of pregnant mares possess gonadotropic qualities suggestive of the true prepituitary hormone. The former (antuitrin S, follutein), which is the factor responsible for positive reactions in the Friedman (rabbit) test for pregnancy, has been shown to provoke no ovarian response in humans, while the latter (gonadogen) is asserted to produce ovulation and corpus luteum formation when administered intravenously.

3. *Estrogens*.—A considerable series of different but related estrogenic substances are available and appear to be potent in the human.

(a) Estradiol (benzoate) is prepared from the follicular fluid obtained from sow's ovaries and is available as dihydrotheelin, progynon B and others. It may be given parenterally or by mouth.

(b) Estriol glucuronide is obtained from human pregnancy urine and from human placenta and is employed as theelol, emmenin, progynon DH. It can be administered by mouth.

(c) Estrone is recovered from the urine of preg-

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nant women and pregnant mares and is dispensed as theelin, progynon, amniotin. It is most effective when given intramuscularly in an oily solution. When treating vaginal conditions (gonorrheal vaginitis, senile colpitis) it may be made into suppositories for local administration.

4. *Progesterone*.—The corpus luteum hormone is available in oily solution for intramuscular injection. Certain of these hormones are prepared synthetically but, whether natural or synthetic, they are physiologically standardized according to units of one sort or another, or are dispensed in weighed amounts.

Other gland products such as desiccated thyroid also are employed widely and appear to be useful. Presumably they act on the gonads through the medium of the anterior pituitary rather than directly and thus emphasize the interrelations of the endocrine system.

Hormone therapy should be used only when there is an indicated need and when it is logical, on the basis of present knowledge, to think that it will correct some functional defect. It obviously is unreasonable to treat the amenorrhea induced by pregnancy, to give hormones to a sterile woman whose husband has no sperm in the semen or to administer gland products for menorrhagia induced by a submucous fibroid; yet such errors frequently are made. Many physicians apparently know of only one hormone product and use it for everything and on everybody who can afford the cost. Such therapy not only piles disrepute on the gland substances but obviously constitutes indefensible medical practice. Moreover, it should not be forgotten that functional disturbances of any organ are liable to spontaneous correction and that the relief which follows hormone administration may not actually be the result of the treatment.

In the light of present knowledge, certain of the functional menstrual disturbances may be treated logically with one or more of the available hormone preparations. There is, however, some difference of opinion concerning what may be called logical and even more about the therapeutic results.

Amenorrhea (primary or secondary) of a functional character is rarely due to conditions primary in the uterus or ovaries but rather should be viewed as resulting from dysfunction of the anterior pituitary or from a widespread endocrine imbalance. Obviously the condition should be designated as functional only after careful pelvic examination has failed to reveal a physical cause such as absence of the vagina, imperforate hymen or pregnancy.

The gonadotropic hormones have not proved particularly useful in producing true menstruation since it is difficult to stimulate ovulation. Recent work suggests that the product obtained from the serum of pregnant mares may be effective but sufficient confirmation of these observations is not yet

available to justify too great hope in this form of therapy. In the usual case, it is simpler to resort first to improvement of the general physical condition by attention to the maintenance of sound hygienic living before beginning expensive endocrine therapy. When the basal metabolic rate is low, as it frequently is, the administration of desiccated thyroid in adequate dosage frequently improves the sense of well-being and may influence the onset of normal periods. It is doubtful whether the gonadotropic hormone from pregnancy urine is of any value.

The problem of provoking uterine bleeding is much simpler but has no value other than psychic. Pseudomenstruation can be produced by giving large doses of the estrogens and then abruptly stopping the treatment. Frank states that it is necessary to give at least 1,000,000 international units to ensure such withdrawal bleeding but others claim similar results with smaller doses. In any event, ovulation is not produced and the bleeding which results cannot be viewed as true menstruation.

Menorrhagia and metrorrhagia entail the development of menstrual periods which are too profuse, too long or too frequent and may be functional in origin although they more usually are due to some structural change as fibroids, retained placental remnants or carcinoma. It is, therefore, commonly wise to perform curettage before assuming the endocrinal nature of the complaint except in adolescent girls in whom the functional type of excessive menstruation is the rule.

Endocrinal menometrorrhagia usually is associated with an excessive production of the estrogens as evidenced by an increased urinary excretion of these substances even though the blood concentration remains unaltered. The endometrial changes are not specific. Hyperplasia of the endometrium may be found, but in other instances the mucosa is of the proliferative variety and not unusually abundant. There appears to be a tendency for abnormal bleeding to occur in young women with lowered basal metabolic rates, but the nature of this response is not clear even though the effect may be by way of the anterior pituitary.

In the usual case of menometrorrhagia it is advisable to obtain a basal metabolic rate and to give reasonable amounts of desiccated thyroid if the rate is low. Furthermore, since there is no method for combating the assumed estrogenic excess by administration of endocrine preparations, an attempt may be made to restore endocrine balance by treatment designed to increase the available progesterone. The anterior pituitary-like hormone from pregnancy urine has been successfully employed for this purpose in spite of the accumulating evidence that there is no ovarian response to its subcutaneous injection. Finally, progesterone has been employed and appears logical and occasionally effective, while its male analogue, testo-

sterone, recently has been used with encouraging results.

Obviously, menometrorrhagia in premenopausal women may be treated more radically than that occurring in adolescent girls. In the former it is reasonable frequently to employ radiation therapy or hysterectomy, whereas in the latter these procedures rarely are indicated. In any instance, attention should be directed to combating the anemia which may result from the excessive bleeding by diet and the exhibition of hematinic drugs and, in certain severe cases, by blood transfusion.

Dysmenorrhea is a purely subjective complaint and therefore difficult to evaluate. It generally is recognized that there is a large psychic element, a fact which further complicates the estimation of the effect of any form of therapy. At present there are apparently two general ideas underlying the endocrine treatment of the condition: (1) that the painful sensations are due to abnormally severe uterine contractions evoked by an excess of the estrogens, and (2) that the uterus is underdeveloped and thus responds abnormally to the estrogenic stimulation. Based upon the first concept, many clinicians give progesterone during the lutein phase of the cycle while those who adhere to the second hypothesis administer estrogen during the early days of the intermenstrual period to stimulate uterine growth. From the available evidence it appears that each mode of therapy is effective in something like 65 per cent of the cases, further evidence that the psychic factor is important. It seems reasonable to use estrogens first when examination reveals an undersize uterus and to reserve progesterone for those patients who do not respond to estrogenic stimulation or who seem to have normally developed genitalia.

In any case, especially among young women, attention should be given to improvement of the general hygiene, correction of postural abnormalities and institution of correctional exercises. Approximately one half of these patients will respond to such measures with marked pain relief. Operative procedures are rarely indicated and never should be considered until all other methods have failed.

Menopausal symptoms apparently are due to some disturbance of the autonomic system which leads directly to the various nervous phenomena such as hot flushes, irritability, nervousness and headaches. The complaints are entirely subjective and therefore prone to be affected by the psychic constitution of the individual. Endocrine surveys have shown that with the cessation of ovarian function, there is an increase of the gonadotropic hormone in the blood and urine and a decrease in the estrogen production which suggests that the symptoms may be due to one or the other. There is apparently no way to decrease the formation of gonadotropic substances except by the administration of the estrogens which, therefore, have been

used widely in this condition. It has, however, not yet been determined whether the clinical manifestations are due to the increase of pituitary activity or to the decrease in estrogen formation.

Evidently, any of the estrogenic substances now available will afford some relief in the majority of patients when administered in the proper fashion and in adequate dosage. The amount necessary to control the symptoms will vary within wide limits. Occasionally weekly injections of 1,000 or 2,000 units will be sufficient, whereas in other patients 10,000 units three times each week may be necessary. It is clearly advisable to use the smallest effective dose not only from the standpoint of economy but also to reduce the possible danger involved in the use of these products. Moreover, it should be recalled that some authorities are convinced that the effects of any treatment of menopausal symptoms are largely psychologic and depend upon their psychic appeal. Study of vaginal smears enables the physician to determine whether or not the treatment has produced the expected hormonal response, but there appears to be little definite relation between the produced physical change and the relief of symptoms.

#### CONCLUSIONS

Assuming that functional menstrual disturbances are due to endocrine imbalances, it is logical to treat them with available gland products. It is, however, essential that any such therapy be logically in accord with our present knowledge concerning the physiology of menstruation and that the hormones not be given indiscriminately as is now so frequently done. It should also be kept in mind that all functional complaints are subject to natural remissions completely unrelated to any therapy. As physicians we should attempt to avoid the fallacies of the *post hoc, ergo propter hoc* argument, and should be genially skeptical about any apparent results of endocrine therapy, which is certainly not yet well established on a firm scientific basis.

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#### CASE OF RUPTURE OF LACTEALS

An unusual case of rupture of one of the intestinal lymphatic glands (the lacteals, which take up the milky fluid called chyle from food after its digestion) is presented in *The Journal of the American Medical Association* for June 8 by Roland L. Maier, M.D., New York, who believes that this is the first acute case to be reported. His patient was perfect well before the attack.

The attack consisted of severe abdominal pain. The patient was hospitalized and operated on. The pre-operative diagnosis was perforation of the intestinal tract. When the abdomen was opened the lacteals were prominent and distended. Some chyle was spilled into the cavity. Observation at operation, Dr. Maier states, "suggests that there was a rupture of one of the lacteals caused by obstruction of the duct that collects chyle, with back pressure on the smaller lacteals. Whether or not the condition will recur remains to be seen, but to date the patient has had no symptoms."



## CIRCULATORY MECHANISM DISORDERS

### RECOGNITION AND MANAGEMENT OF THE COMMONER SUDDEN DISTURBANCES

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Sudden disturbances in the circulatory equilibrium create some of the most critical situations, in many of which exitus is often imminent. Immediate recognition is imperative and the prompt and proper management and administration of treatment is often life saving. Intravenous and intracardiac injection of powerful new drugs sometimes must be resorted to even though such procedures may seem heroic. The conditions requiring specific maneuvers and medication, the nature, indications, effectiveness, limitations, dangers and dosage of the newer therapeutic agents should be familiar facts at every practitioner's finger tips. As a physician, one may be expected to be fully equipped to meet all such emergencies. Reiteration and recapitulation of the diagnostic criteria and the therapeutic indications are warranted without question.

Fortunately there are many relatively benign circulatory upsets which are self limited, stop spontaneously or respond to some simple manipulation or the exhibition of some safe remedy. Thorough knowledge of such situations is most reassuring. It is quite important to know when to use and when not to use heroic measures. In acute episodes the differential diagnosis must be instantaneous. A rapid, thorough survey and analysis of the whole clinical picture must be accomplished in a few seconds. Medical intuition born of years of active experience will bear fruit under emergency circumstances. The presenting symptoms, color and general appearance of the patient, position, neck vein filling and movements, response to stimuli, heart sounds, rate and rhythm, blood pressure, eye, oculo-cardiac and other reflex reactions, carotid sinus pressure effect and, when possible, electrocardiographic study yield diagnostic evidence and should be included in a rapid survey of every critical situation that might be of cardiovascular origin.

#### COMMON SUDDEN REFLEX CIRCULATORY DISORDERS

Simple syncopal attacks, faints without fits, are usually rather benign episodes. The diagnosis is not difficult particularly when attacks appear in certain types of individuals, have recurred, are momentary, transient and present associated phenomena of nausea or vomiting. Any emotional stress and strain, visual or auditory shocks, the precipitating factors, may be followed by a slowly developing or sudden inadequacy or failure in cerebral circulation. Cerebral anemia within from two to three seconds causes giddiness, vertigo, weakness, visual disturbances, black spots before the eyes, un-

steadiness, restlessness, confused speech, drowsiness, yawning, nausea and vomiting, headache, loss of memory, inability to concentrate, amnesia, aphasia and paresthesia. A prolongation of the cerebral circulatory disturbance for from three to five seconds results in loss of consciousness and after from ten to twelve seconds deep sighing respiration, twitching and convulsions occur. If cerebral ischemia lasts for more than twenty seconds, cyanosis appears. This syndrome probably should be designated cerebral syncope which literally means the cutting off of the blood flow to the brain.

#### VASOSYMPATHETIC FAINTS

In the temporary vasosympathetic loss of tone with engorgement of the great splanchnic venous bed the stomach and gut walls are congested acutely and intensively. The return flow to the heart is impaired, the filling is inadequate, the blood pressure drops below the critical level of 80 to 60 mm. of mercury systolic. This systolic level is too low to insure adequate cerebral circulation in an upright, even normal, individual. In those with arteriosclerotic cerebral vascular systems, higher systolic pressure levels are necessary to maintain sufficient blood flow to prevent cerebral anemia.

Besides the low blood pressure the pulse rate is rapid and the patient is deathly pale. Seldom and rarely does a trace of cyanosis appear. There is no conjugate deviation of the eyes and the pupillary and corneal reflexes persist. There is no frothing at the mouth, no biting of the tongue or loss of sphincter control. In the prone position which the patient assumes consciousness may be returned promptly. If there is any delay, reflex stimulation of cold water to the surface of the skin of the face will revive the patient. Other types of the cardiovascular neuroses as neurocirculatory asthenia or the effort syndrome may present ordinary fainting as a common symptom.

#### VASOVAGAL OR CAROTID SINUS FAINTS

The arterial wall bulgings just at the beginning of the internal carotid arteries are supplied richly with nerve ends. The carotid sinuses and connections with vagus nerves are important links in the automatic regulatory system for the normal control of blood pressure. The root of the aorta, where the walls are slightly thinner with fewer muscle fibers and more elastic tissue, is another pressure receptor. The nerves from these areas join certain cranial nerves at the base of the skull to proceed to the vasomotor center in the diencephalon. The two great splanchnic areas form counterbalancing units of this system.

Mechanical pressure stimulation in individuals with hypersensitive carotid sinuses causes a reflex increase in vagus tone, inhibition of the sino-auricular nodal activity, sinus bradycardia and sometimes a sino-auricular standstill with decrease in the vasomotor tone and secondary vasodilation. The patient's color generally remains good. The blood

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pressure, of course, drops but characteristically the heart action, rate and pulse are slow. The patient in the supine position usually promptly recovers consciousness spontaneously. The carotid sinus reflex responds to the slightest stimulation. An episode can be reproduced by the pressure over the bifurcation of the carotid or over the eyeballs or sudden bending of the neck over a high stiff collar will call forth the reflex. Tincture of belladonna three times a day after meals, or atropine,  $\text{SO}_4$ , 1/150 gr. three times a day usually will prevent the recurrence of attacks.

#### ORTHOSTATIC OR POSTURAL HYPOTENSION

The vasovagal disorder, with failure of the rapid reflex circulatory readjustment of constriction in the splanchnic area for the maintenance of the blood pressure as an individual assumes an upright position, is of obscure etiology. There is most certainly an imbalance in the vegetative nervous system. Many patients with orthostatic or postural hypotension have been shown to have central nervous system syphilis. When in a vertical position or upright status, patients with this disorder characteristically show a gradual fall in the systolic level of blood pressure within a few minutes to 80, 70 and 60 mm. of mercury. The pulse rate remains practically unchanged. As the critically low blood pressure levels are reached the patient presents all the symptoms that were outlined previously as accompaniment of cerebral anemia.

The rate of appearance of symptoms is about the same as it is during the splanchnoparesis and not as rapid as in the carotid sinus or Adams-Stokes' syndrome. The pulse is somewhat more rapid; syncope intervenes when the pressure drops below 80 and consciousness returns rapidly as the blood pressure promptly rises to normal when the patient reaches a horizontal position. If the patient's head is lowered further there is characteristically a rise of blood pressure to hypertension levels indicating the complete loss of the reflex regulatory mechanism.

#### BENIGN AND SERIOUS MECHANISM CHANGES IN THE HEART ACTION OR BEAT

Sudden cardiac mechanism disorders, acute or sudden derangement of the cardiac mechanism or changes in the heart beat at times causes such precipitous drops in blood pressure and blood flow and such striking forward failure as to cause syncope. Although uncommon they may occur with sufficient frequency to justify restatement from time to time. They may occur with such dramatic severity that prompt and proper diagnosis and emergency treatment alone will prevent catastrophe. Then, too, usually the response to therapy is spectacular.

A rapid heart action results not only in incomplete filling but also in rapid decrease in the outflow from the heart. Abnormally slow heart action or suspension of the heart beat may be accompanied simply by a rapid flow of the output, a drop

in the pressure and cerebral anemia. Organic obstructions of the outflow at the aortic ring or incompetency of the valves may result in critical regurgitation which in the presence of arteriosclerotic hardening of the cerebral vessels leads to cerebral anemia. Ball valve thrombosis in the mitral ring prevents much ventricular filling. Rapid effusion of the pericardial sac prevents adequate diastasis and may compress the auricles to collapse. The decreased left ventricular output contributes to forward failure.

Disorders in the heart action are reflected promptly in disturbances of the blood flow. The heart rate suddenly may become rapid or slow. The rhythm may remain regular or become irregular and the results may be serious or innocuous. Fortunately the benign disturbances are more common and the malign ones are quite rare.

#### PAROXYSMAL AURICULAR TACHYCARDIA

Paroxysmal tachycardias are fairly common and usually benign. An attack results from an ectopic focus suddenly becoming most irritable and superceding the sino-auricular node, the normally supreme pacemaker. The rate suddenly rises within one beat to 180, 200 or 240 per minute with the maintenance of the ectopic auricular rhythm for shorter or longer periods of time; it drops to a subnormal rate within one beat as it began. This may occur during an acute infectious disease, particularly pneumonia, following a surgical operation or a physical strain. Attacks may be quite disturbing, particularly to the physician. As a rule the paroxysms stop spontaneously after from a few minutes to a half hour. Occasionally they may continue for hours and sometimes longer and may jeopardize recovery in serious infections when accompanied by falling blood pressure. Serious interference with the recovery or the success of an operation may result from disturbed circulation in the field. Sudden onset, the absolute regularity, the high rate and the sudden offset results, response in half of the cases to an indirect vagus stimulation constitute a characteristic symptom complex.

When a paroxysm creates a state of emergency as it does in the presence of some other serious condition or when the high rate disturbs the patient considerably it is desirable to stop the attack as quickly as possible. The first step is to attempt to invoke a carotid sinus reflex on the right side by sharp compression of the bifurcation of the carotid impinging it against the transverse processes of the cervical vertebrae. In some patients the oculo-cardiac reflexes or pressure of the eyeballs results in prompt suspension of the tachycardia, irritation of the ears, forced inspiration and expiration against a closed glottis; unusual position, lying down and bending have been found to stop paroxysms in some patients.

Ipecac syrup has been found by Sprague to be the safest and most satisfactory drug method for stopping attacks of paroxysmal auricular tachy-



cardia. One or two dram doses of a fresh syrup of ipecac will cause nausea and vomiting within from fifteen to forty-five minutes. If this does not occur the dosage should be repeated. It may be necessary to increase the dosage to the point of a parasympathetic stimulation in order to get peripheral and central vagus action in refractory cases. Morphine sulphate in  $\frac{1}{8}$  to  $\frac{1}{4}$  gr. doses hypodermically is usually a successful therapy. In the event of frequent recurrences morphine should be withheld because of the danger of habituation. The sensitivity of a patient to quinidine sulphate should be tested by a 1 gr. dose and then doses of 5 grs. may be given every hour, administering as many as eight doses if necessary to stop an attack.

One should postpone, as a rule, the introduction of all intravenous therapy and employ such heroic methods only as a last resort. Wilson and Wishart have advocated the intravenous use of 10 cc. of digifolin solution. I have found the action of digoxin and digilanid in  $1\frac{1}{2}$  to 2 mgm. doses quite as successful. St. Feher advised the use of 20 per cent solution of magnesium sulphate intravenously, 5 cc. slowly and then 5 cc. more rapidly to prevent severe and persistent attacks. Starr and Stroud found acetyl-B-methylcholine in from  $\frac{1}{6}$  to  $\frac{1}{2}$  grain, 10 to 30 mg. subcutaneously increased the vagus tone to a considerable extent. Then, carotid sinus pressure which previously had been ineffectual will cause a sudden cessation of the disorder.

When there has been a history of recurrences of paroxysms it is quite important to introduce preventive measures following a successful interruption of an attack. Assurance and establishment of self confidence and a slight psychological readjustment must be accomplished first. Absolute abstinence from the use of caffeine, tobacco or taking of other poisons may be helpful in removing the tendency to paroxysms. The intake of potassium in the diet as the iodide, acetate or chloride may reduce cardiac irritability. Quinidine sulphate in small daily doses of 5 gr. often will prevent the return of attacks. In some cases it may be necessary to resort to digitalization and regular maintenance dosage as a protective prophylactic measure. In some patients regular exercises may be desirable. Sudden physical as well as mental strains must be avoided.

Paroxysmal sinus tachycardias are usually of slightly more serious moment, are associated more frequently with failure, anoxemia, cardiac tamponade, ball valve obstructions in old mitral valve stenosis, in congenital disorders and in serious infections with pericarditis and toxemias. The onset is usually insidious but may be sudden. The pulse is thready, the rate is high but usually not as high as in paroxysmal auricular tachycardia. The rhythm is not quite as regular from minute to minute and sometimes varies considerably from day to day. The blood pressure falls and in the presence of developing cardiac tamponade and in ball valve thrombus it continues to drop to dan-

gerously low levels. The heart sounds are distant. The electrocardiograms show P and T waves so close together that they cannot be separated. Differentiation from paroxysmal auricular tachycardia is difficult except for the slight fluctuation in the rate. The presence of ST and T wave changes in all leads suggests the pericardial effusion. There may be evidences in high, broad and notched P waves of auricular hypertrophy and damage and of the right ventricular preponderance.

In patients with mitral stenosis and ball valve thrombosis presenting these attacks, standing on the head will sometimes bring relief. In rapidly accumulating pericardial effusion or hemorrhage pericentesis is desirable and necessary. The presence of signs of failure calls for rapid digitalization by the intravenous injection of digoxin or digilanid, digalin or digifolin and will often be life saving.

#### PAROXYSMAL JUNCTIONAL VENTRICULAR TACHYCARDIA

Paroxysmal junctional tachycardias are of more serious significance. They last much longer, usually for months, and are much more refractory to treatment than other types of tachycardia. Cinchonization always should be tried but usually it is necessary to resort to digitalization to sustain the myocardium in the prevention of failure. The diagnosis is difficult. It is suggested by the persistence of disturbance in the face of active treatment. The diagnosis must be made by the electrocardiogram and it is difficult even then at times to establish it from the curves.

Paroxysmal ventricular tachycardia is the most serious of the regular tachycardias because it usually, although not absolutely always, originates in a myocardial infarction area. The diagnosis is simple if the patient has had prolonged anginal seizure or extreme dyspnea and has had some irregularity due to ventricular ectopics. Under such circumstances a paroxysm has a high rate but not as high as 200, usually between 140 and 180, and is slightly irregular in counts from minute to minute. The electrocardiograms are usually characteristic but an auricular or supraventricular tachycardia in the presence of a bundle branch block may give quite a similar picture. Quinidine sulphate in 5 gr. doses is almost a specific therapy. It is given in 5 gr. doses every hour for not more than eight doses. It may be used effectively subsequently in one or two doses of 5 gr. each a day as a prophylactic.

#### SUDDEN SERIOUS CARDIAC MECHANISM DISTURBANCES

Paroxysmal atrial or auricular flutter may be accompanied by few or many symptoms and simulate quite closely sinus or auricular tachycardia. It is the less common type of circus rhythm and characteristically is accompanied by a two to one block so that in spite of the auricular rate of 160 to 300 the pulse rate is low, between 130 and 150. It is most unusual to have a one to one response with a high rate in the neighborhood of 300 which would cause considerable embarrassment. Auricular flutter

usually responds temporarily with slowing upon pressure in the region of the carotid sinus. Its reflex vagus reaction is characteristically sensitive for a short period of time but within a few minutes the labile auricular ventricular conduction mechanism escapes from the vagus effect. The rate then returns to the same high level that it was in spite of continued stimulation. This is quite different from paroxysmal auricular tachycardia which stops completely if it stops at all.

Rapid quinidinization may change auricular flutter directly into normal mechanism. Digitalization may cause increase on the two to one block and if digitalis administration is continued, auricular fibrillation usually is precipitated. When the withdrawal of the drug and elimination is complete there follows usually the reestablishment of a regular mechanism. Absolutely conclusive evidence will be found in electrocardiographic tracings which show the presence of regular atrial activity. Occasionally a patient is found to resist all forms of therapy and the auricular flutter persists. Associated conditions should be sought and treated, particularly in the presence of rheumatic carditis, hypertension, hyperthyroidism and coronary artery disease.

Paroxysmal auricular fibrillation is a rather common recurrent disorder presenting the complete irregular heart action, usually a definitely auricular action with a rate of 450 to 600 per minute of which only about 25 per cent get to the ventricle as impulses. This would produce a haphazard heart action of about 160 per minute at the most and usually one third of the beats fail to raise the left ventricular pressure high enough to open the aortic valve. This wastage of cardiac energy is apparent in the difference between heart rate and the pulse rate. The indications are for erasure of this dissipation as promptly as possible. When suggestive evidences of congestive failure are at hand, start the treatment procedure with the administration of digitalis in the moderately rapid fashion of  $7\frac{1}{2}$  grs. (0.5 G.), repeated in from four and six hours. In a serious situation one may inject digoxin, 2 mg., or digilanid, 3 mg. Digitalization is usually effective in increasing the conduction time between auricle and ventricle and cutting down the ventricular rate sharply. Digitalis should be continued until the rate is 60 to 70 per minute and maintained at that level so that every beat comes through.

In most cases of paroxysmal auricular fibrillation it is perhaps desirable first to try the effect of quinidine sulphate after determining the patient's sensitivity to the drug by a small 1 gr. dose. It is desirable to start as in other disorders with a 5 gr. dose every hour until there is a change but not for more than eight hours in succession. Quinidine should not be given intravenously for it is quite dangerous when administered so. Perhaps it should be withheld when there is evidence of bundle branch block.

Digitalization by intravenous injection rarely is

necessary. In some it is desired and may be accomplished by the use of digoxin or digilanid, digalin or digifolin intravenously or intramuscularly. Sufficient total dosage should be figured out according to the body weight to produce digitalization and not more than 75 per cent of such dosage should be given in the first dose. The oral administration of pills of powdered leaf should be the method of choice in general with doses of four  $1\frac{1}{2}$  gr. (1 cat unit pill), a total of  $7\frac{1}{2}$  gr. (or 4 cat unit), repeated in three hours and then again after six and after twelve more hours and then  $1\frac{1}{2}$  gr. every six hours until nausea or ectopics appear. If digitalis is used, chronic auricular fibrillation is present. Continued digitalization, of course, is necessary in light daily maintenance doses of from  $1\frac{1}{2}$  to 3 gr. (0.1 to 0.2 g.). Associated conditions should be investigated carefully and treated as carefully and as completely as possible.

Paroxysmal ventricular tachycardia, flutter and fibrillation are usually a part of a clinical picture of coronary occlusion and myocardial infarction and should be discussed further under that heading. These most certainly create an emergency situation but rarely are recognized clinically as causes for syncopal attacks. Occasionally one is recorded and I have records of short runs of ventricular fibrillation during which the patient presented Adams-Stokes' seizures. Sudden death following an anginal seizure or after an electric shock usually is attributed to ventricular fibrillation. The electrocardiographic studies have shown most of these to be just complete asystole. In ventricular flutter and fibrillation there is little and no more movement in the blood column than there is in complete asystole and the dilated ventricle. The diagnosis varies considerably because no regular heart sounds are audible. No pulse is present and the blood pressure is not obtainable. The patient is usually in collapse and unconscious.

#### AURICULOVENTRICULAR HEART BLOCK

Partial and incomplete auriculoventricular block may be entirely asymptomatic and frequently is suspected only by the occurrence of a slow pulse. The drop in heart rate may come on insidiously or suddenly. In some individuals, however, particularly those with cerebral arteriosclerosis, slowed heart rates of 60 to 40 beats per minute are frequently accompanied by giddiness and vertigo. The slow rate is in itself quite suggestive of block, particularly when it is in the neighborhood of 40 per minute. A rise in the rate that amounts to a doubling or a definite multiple of the previous rate or when there is no change whatsoever after exercise are further clinical evidences in support of the diagnosis. Again the only certain method or actual method of establishing a diagnosis is by means of an electrocardiographic tracing. Most patients with partial or incomplete heart block carry on for years without any embarrassment directly attributable to the abnormally slow heart action.



## ADAMS-STOKES' SYNDROME OF CONVULSIVE SYNCOPE

Sometimes there is a condition of partial auricular ventricular block of high grade that is shifting with slight increases in stress or for no known reason changes to complete block. Under such circumstances the ventricle muscle is sometimes not irritable enough to establish a ventricular pacemaker promptly. The result is a temporary asystolic state in which there is no ventricular contraction to propel the blood into the great vessels, the aorta and on to the brain. As a result cerebral anemia intervenes with sudden vertigo which rapidly passes into syncope after which a convulsive state often ensues. In some cases in the presence of complete heart block, the idioventricular pacemaker, for no known reason, seems to fatigue and slow down to the point at which the minute volume is insufficient to keep up the circulation in the brain, the rate dropping from 40 to the 20's and lower and the slowing produces the clinical picture of convulsive syncope of Adams-Stokes.

The suspension of ventricular activity may continue for as long as four or five minutes. Some consider it possible to revive the patient with resumption of ventricular contractions after as long an interval as eight minutes. It is therefore apparent that the moments of ventricular asystole are precious ones and no one ever is able to state or know whether or not the ventricle is again going to contract.

## THE TREATMENT OF VENTRICULAR STANDSTILL AND CONVULSIVE SYNCOPE

In emergencies, rapid, powerful, sharp blows over the precordium directly and mechanically directly may stimulate the ventricular heart muscles to premature contraction and in that way help in the reestablishment of ventricular activity. Injection of drugs intravenously into a peripheral vein is of no value in such an emergency because the blood mass is not moving. It may be possible to cause blood containing stimulating drugs injected into an engorged jugular vein to gravitate into the right atrium by keeping the patient upright. This position, however, further interferes with the cerebral circulation.

Intracardiac therapy is heroic but must be considered whenever asystole is present. A 2½ inch, 22 gauge needle attached to a syringe containing 5 minims of epinephrine or adrenalin solution should be at hand. The needle is thrust directly into the heart muscle, usually penetrating the cavity of the ventricle. The needle prick itself may start the contraction. Slow injection should be started as the needle is withdrawn. Three to 5 or 7 minims of 1:1000 adrenalin is enough. Larger doses of adrenalin injected intracardiacly are dangerous because they may produce ventricular fibrillation. Prophylactic treatment, prevention of episodes, may be accomplished by maintaining the ventricular muscle irritable with barium chloride, ¼ gr.,

10 mg., three times daily, ephedrine, Hcl., ⅜ gr., .024 g., three times daily, or paredrine, ⅓ gr., 10 mg., three times daily. Adrenal in oil ⅓<sub>1000</sub>, 5 to 10 mg. subcutaneously is the most rational prophylactic undertaking.

## ACUTE CONGESTIVE HEART FAILURE

The left ventricle may fail suddenly during the night in patients with hypertension and aortic regurgitation and grave symptoms may be presented precipitately. Nervous excitation and air hunger may awaken the patient from a deep sleep with a start. The attack often causes the patient to get out of bed and go to the window. In some there develops a severe expiratory dyspnea with wheezing and groaning of asthmatic breathing that is indistinguishable from that of bronchial asthma. This type of episode has been termed cardiac asthma. The coughing may become severe and be accompanied by the production of fine crepitant rales throughout the lungs and a blood tinged sputum that is frothy and considerable in amount. This may cause a prolongation of the attack or nocturnal paroxysm. Respiration may then become more periodic with a shorter or longer phase of apnea and be typical Cheyne-Stokes breathing.

There is considerable evidence that the central respiratory center changes are of most serious moment and that pulmonary stasis is significant in giving rise to Hering-Breuer stimuli. Great anxiety is the predominant symptom and air hunger seems to make the patient "panicky." The breath seems to go so far and no further. The respiration is rather shallow and rapid and seemingly quite ineffectual. Then again there may develop gasping, sighing, thrashing around, noisiness and restlessness.

The pathophysiological explanations of these disturbances are still quite theoretical. In left ventricular failure there must be accumulation of various acid metabolites in all tissues, particularly in the poorly irrigated peripheral musculature. This leads to the changes in the activity in the respiratory center. Pulmonary congestion leads to the decrease in carbon dioxide accumulation. Sleep removes the control of the respiratory center from the higher centers and local respiratory center acidosis develops. Carbon dioxide tension rises and the usually otherwise overactive vagotonia increases during sleep. The blood pressure and pulse rate usually fall so that the perfusion of the respiratory center as well as the general musculature becomes less adequate. These conditions develop simultaneously, usually during the deepest sleep, to a certain point at which an attack is precipitated. The systolic and diastolic blood pressure and pulse rate rise sharply as the dyspnea increases.

The absolute specificity of morphine sulphate in this condition is the strongest evidence of central nervous origin of most of the trouble. Promptly following ¼ gr. injection anxiety is allayed and excessive reflexes from the lungs are interrupted.

The cough stops and sweating and pallor disappear. Cheyne-Stokes breathing may develop. The blood pressure, both systolic and diastolic, drop to normal. The increased parasympathetic tonus may be relieved by atropine and the cardiac asthma gradually subsides.

In severe attacks of pulmonary edema it may be indicated to administer intravenously left ventricular heart muscle tonics as digoxin or digilanid. In profuse exudation a tracheal catheter should be introduced and suction applied to remove the bronchial secretion and prevent drowning of the patient.

Digitalization has a remarkable effect in increasing the left ventricular tone and relieving the patient of attacks completely. In an acute stage of pulmonary edema emergency stimulation with crystalline cardiac glucosides in support of the left ventricular myocardium may be necessary to save the situation. The older emergency preparations were inert or dangerously and irregularly potent. The results with strophanthine and quabaine were not absolutely dependable and the element of danger restricted their use considerably. The newer digoxin or digilanid may be introduced intravenously in  $1\frac{1}{2}$  to 2 mg. doses. Aminophyllin may be dangerous in increasing the blood volume, thus adding sharply to the burden of left ventricle.

#### ACUTE RIGHT VENTRICULAR FAILURE

Acute right ventricular failure does not present such a dramatic or ominous clinical picture. The patient is not erethistic but is actually stuporous. Sometimes there is little increase in dyspnea and therefore much less discomfort. Massive rapid transfusion or infusion may cause the only genuine cardiac dilatation of the right ventricle; avitaminosis and high grade mitral stenosis predispose to right heart failure. The chief symptoms are exhaustion, pain in the abdomen from distended liver, nausea and vomiting and a general dropsical state.

The neck veins become engorged and present a positive venous pulse. The liver becomes enlarged and tender and actually may pulsate. A loud tricuspid murmur develops. Emergency treatment consists in venesection. The removal of 500 cc. of blood usually will clear the situation, take the load off of the right heart and give it a chance to come back. Intravenous digitalis, alkaloids as digoxin and digilanid are of value in restoring normal tone of the ventricular myocardium. Slow digitalization with the powdered whole leaf should be continued.

#### THORACIC PAIN

A sudden attack of paroxysmal pain in the chest usually creates a serious situation. It may be considered in a discussion since it so commonly is due to an acute coronary insufficiency or failure of the angina pectoris type. Paroxysmal anginal pain is probably most common but one, however, must consider if the pain is somewhat prolonged, coronary occlusion with myocardial infarction, acute

pericarditis, dissecting aneurysm of the aorta and pulmonary embolism.

The genuine paroxysmal cardiac pain of stress comes on under emotional strain, on effort and after eating. It is substernal, radiates to the precordium down the inner side of the arm, sometimes both but usually the left. The pain may spread into the neck and up into the jaw and cause the patient to assume a statuesque position. It rarely lasts fifteen minutes and often is relieved spontaneously by absolute rest. The pain of paroxysmal coronary insufficiency is characteristically and spectacularly controlled by nitroglycerine, 1/200 gr. to 1/100 gr., and is administered under the tongue. In the presence of low blood pressure the vasodilating effect of whiskey will relieve the pain more safely but it takes a little time. Concentrated 100 per cent oxygen atmosphere has been shown by Boland to relieve the pain in a few minutes.

In middle aged, stolid individuals, there need not be any physical sign for the establishment of the diagnosis. Usually, however, there are evidences of abnormalities, particularly at the root of the aorta as the widening of the aortic dullness, the accentuation of the aortic second sound and a systolic aortic murmur in the presence of a normal blood pressure. Slight electrocardiographic abnormalities in the ST segments may be present but are by no means absolutely prerequisite to the diagnosis. The classical clinical picture may be accepted as diagnostic in a man of 40 years or more, while in women, physical signs must also be demonstrable for the diagnosis.

Prevention of attacks consists in removal of precipitating factors as restrictions as to exposure, to nervous strain, emotional stress and exertion, and overeating. It usually will be beneficial to administer barbiturates which protect by decreasing nervous irritability. Food and drugs to which the patient is sensitive, particularly coffee and tobacco, absolutely should be interdicted. Abnormalities of the blood, as anemia, should be corrected. Hyperthyroidism and hypothyroidism should be controlled. Treatment thus depends upon the conditions present. No medication can be considered curative except perhaps in the presence of definite evidence of syphilis.

Systematic care consists mostly in avoiding the precipitating factors and in management of acute episodes by symptomatic treatment. In the acute attack 100 per cent atmosphere oxygen administered through a B. L. B. mask is perhaps the safest measure. Next in order comes the nitrites if the blood pressure is elevated. Amyl nitrite is not sufficient but is not so likely to be followed by the disagreeable flushing, throbbing, fullness in the head, palpitation, vertigo and syncope. Octyl nitrite is still experimental. Nitroglycerin is perhaps safest if the blood pressure is well sustained or high. In hypotension, a hot toddy of whiskey is the vasodilator of choice.

Codeine SO<sub>4</sub> in  $\frac{1}{2}$  to 1 gr. doses effectively may



relieve pain and is not likely to be habit forming. Morphine sulphate in  $\frac{1}{4}$  gr. doses may be necessary but should be reserved and used only after the first quarter hour of pain. Those who have sensitivity to morphine with severe gastrointestinal symptoms from it should be given pantopon or dilauid. The dose of dilauid must be small, as little as  $\frac{1}{32}$  gr. Sodium citrate and glucose solution amounting to 300 or 500 cc. has been advocated as a vasodilator but there is little proof of its efficiency as a means to overcome the narrowing of the arterial bed. Absolute rest for at least an hour after an attack should be insisted upon. In an extreme case of heart pain, aminophyllin may be given intravenously. Heparin must be considered in those cases in which there is a suggestion of an advancing thrombosis and coronary occlusion symptoms. Frequent recurrent attacks of cardiac pain with persistence of soreness might lead to status anginosus. It may require more than the usual and stronger sedatives than barbiturates and large doses of vasodilators. A general anesthetic is sometimes necessary to bring relief. Alcohol or novocain infiltration into the third to fifth dorsal root is resorted to in patients with status anginosus.

#### CORONARY OCCLUSION WITH MYOCARDIAL INFARCTION

Coronary occlusion and myocardial infarction are considered when thoracic pain is persistent for longer than fifteen minutes or when extreme dyspnea is presented that cannot be explained by any other mechanism. The pain may be substernal, epigastric or precordial with radiation into the left arm or the neck of interscapular region. Dyspnea is usually an accompaniment and shock frequently develops. The blood pressure may rise precipitately but usually falls sharply or continues to drop and remains at a low level. A friction rub may appear. The electrocardiograms usually show striking ST segment and T wave changes and the fluoroscopic examination and kymoroentgenograms show defective movement of the infarcted ventricular wall. Within a day, fever, leukocytosis and increased sedimentation rate appear and the electrocardiogram shows progressive changes in the ST segments.

The treatment of coronary occlusion should consist in relieving the pain with morphine sulphate in  $\frac{1}{4}$  gr. doses repeated if necessary. If cyanosis is present oxygen in 100 per cent atmosphere in a B. L. B. mask is in order. Oxygen also will relieve the pain. As the pulse rate continues to rise with evidence of suggestive advancing thrombosis, heparin may be introduced intravenously in saline solution increasing the clotting time to one hour. Sex hormones in 10,000 unit dosage have a slow vasodilating effect and are a parasympathetic stimulant to the intestinal canal, tend to tone the gut up and relieve the ileus and distention. Concentrated solutions of glucose given intravenously are not without danger.

Accompanying peripheral circulatory collapse or shock calls for medication. The usual shock therapy

with external heat and hypodermoclysis alone is rarely successful. Cortical extract may be used to advantage and neosynephrin may be introduced intravenously. Any of these maneuvers might produce premature contractions and paroxysmal ventricular tachycardia. In the latter, if a rapid mechanism disorder intervenes, quinidine sulphate must be given in 5 gr. doses every hour until the paroxysm stops or until the patient has had eight doses. In the presence of frequent premature contractions quinidine should be given as a prophylactic against the paroxysm of ventricular tachycardia.

Dissecting aneurysm of the aorta may present a clinical picture indistinguishable from that of acute anginal failure. The pain, however, may radiate more widely into the back and particularly down the back and the legs. Peripheral circulatory collapse may be more exaggerated. The characteristic ST segment changes in the electrocardiogram are missing. Fluoroscopic study and roentgenograms will show the dilated aortic shadow. Auscultation may reveal murmurs down the back even as low as the sacrum, systolic in time and transmitted downward. Occasionally a patient may recover from this acute attack. The chief indication seems to be to relieve the pain with morphine and combat the shock most carefully and conservatively.

Pulmonary embolism with acute cor pulmonale presents a simulating ominous symptom complex which, however, usually may be differentiated clinically. The pain usually is not so severe, is shorter in duration and may be entirely absent of shock but the dyspnea is usually extreme. The heart is overactive and basal friction sounds and rubs may appear due to the dilated conus arteriosus and right ventricle. The  $P_2$  sound is accentuated loudly. It may take some time for the lung signs to develop. Electrocardiographic findings may be present for only from four to five hours after the onset of the attack and may be slightly atypical and suggestive of right ventricle changes. Some changes may persist.

Precipitating factors may be established in the event of repeated episodes. The source of the emboli should be sought and removed when it is possible to do so. It is frequently in the pelvic and deep femoral veins in obstetrical and gynecological cases and in the bed-ridden cardiac cases. The dilated heart with mural thrombi occasionally may be the source of emboli and local stasis thrombosis may occasionally occur in the congested lung of one with heart disease.

Acute cor pulmonale calls for emergency therapy. Papaverine and morphine along with heparin have been introduced intravenously to relax the spasms and prevent further thrombosis. Oxygen and aminophyllin have been used for similar purposes. One must attempt to get oxygen directly to the heart muscle by mass action or with xanthines or attempt to get it there by dilation of the coronary arterial vascular bed. There are few institutions

that are equipped and have the operating room equipped to take care of pulmonary embolism immediately by pulmonary embolectomy or the Trendelenberg's operation and the mortality has been so high as to forbid consideration of it.

#### SUMMARY

I urge the busy practitioner to review from time to time an up to date résumé of the commoner medical conditions that call for prompt diagnosis and emergency treatment.

With such knowledge at his command he will maintain an emergency bag and be ready to meet almost any situation.

As special equipment he should have near at hand a B. L. B. aviator mask and a small portable tank of oxygen with flowmeter attached.

His emergency kit should contain a 2 cc. and a 10 cc. glass sterile syringe and two sterile 24 gauge needles and one platinum, 2½ inch, 22 gauge needle for intracardiac therapy. He should have sterile vials of hypodermic tablets of 1:100 gr. atropine sulphate, ¼ gr. morphine sulphate, ⅓ gr. pantopon, ½ gr. dilaudid and ⅜ gr. ephedrine HCl.

He should carry ampules of 1 cc. of 1:1000 adrenalin HCl, 1 cc. paradrinol sulphate 20 mg. (⅓ gr.), digoxin hypoloid, 0.5 mgm. ⅓ gr.), aminophyllin 0.3 g. (4 gr.), in 10 cc. and 0.5 g. (7½ gr. in 2 cc.), to be diluted to 10 cc. or 20 cc. in sterile saline solution, ampules of Mecholyl powder, 0.05 g. (1½ gr.), (acetyl-B-methylcholine, Merck) to be diluted to 10 cc. or 20 cc. sterile saline solution and ampules of sterile saline solution, 10 cc.

In addition he should have a bottle of 30 cc. of fresh potent syrup ipecac and a supply of quinidine sulphate tablets of 1 gr. or .065 g. and 5 gr. (0.3 g.), and powdered leaf digitalis pills of 1½ gr. (0.18). Spirits of nitroglycerin or fresh hypodermic tablets, ⅓ gr. (0.0065 g.), 10 cc. of heparin solution (Hoffmann La Roche, Nutley, N. J.) and theelin in oil 1 cc. of 10,000 units.

With such adequate equipment and a fair knowledge of the subject and judgment and self confidence that has been built on years of experience and success the physician will undoubtedly promptly restore many to normal and save some from destruction.

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#### CITES FIRST RELAPSING FEVER CASE TO BE REPORTED IN OKLAHOMA

The first case to be reported in Oklahoma of relapsing fever, an acute infectious disease often found in certain tropical countries but rarely observed in the United States, is cited by W. P. Neilson, M.D., Enid, Okla., in *The Journal of the American Medical Association* for July 13.

The disease is characterized by recurrent attacks of fever and chills. The causative micro-organisms are spirochetes of the genus *Treponema*, generally transmitted to man by means of ticks and lice. Although Dr. Neilson found the organism in his patient's blood, he was unable to determine the origin of the infection.

## FOOD ALLERGY

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The difficulty of diagnosis and the clinical importance of food allergy has accounted for the many expositions of this subject during the last decade. It also prompts the present paper because recent clinical experience indicates that procedures in diagnosis are not as yet fully understood. This paper is concerned first with the value and use of skin tests and, second, aims to present a brief résumé of the necessary diagnostic procedures to be followed in establishing the presence or absence of food sensitization.

#### ANALYSIS OF SKIN TESTS FOR FOODS

To present the approximate diagnostic accuracy of skin tests for foods two sets of findings will be used: first, the results of repeated skin tests with fourteen selected foods in a series of patients whose symptoms have been clinically controlled; second, study of 659 patients subject to various allergic syndromes in whom the diagnostic accuracy of routine skin tests for all foods may be compared with their known food allergies.

*Analysis of Repeated Intracutaneous Tests for Foods.*—This study was made to determine the value of repeated skin testing as the solution of the diagnostic problem for foods. A group of twenty-five patients was selected for this study. The criteria for inclusion were: (1) definite clinical control of symptoms with proved food allergies and (2) that they gave on initial testing clear-cut negative and positive tests, hence, eliminating any interpretative error due to excessive skin irritability. There were ten patients with asthma, five with perennial vasomotor rhinitis, four with migraine, four with eczema and two with gastrointestinal allergy.

The foods selected for testing were: wheat, corn, egg, milk, string bean, potato, tomato, lettuce, coffee, apple, peach, pineapple, beef and pork. Intracutaneous tests with these foods were run in such a manner as to simulate the normal use of repeated food tests as a diagnostic measure. In some instances duplicate tests were run, i. e., fourteen on each arm. In most cases a single set of tests was made. They were repeated at various times and under various dietary conditions over a period of from a few weeks to three months. In all instances the order of application was identical so as to avoid error in the successive tests due to differences in the degree of sensitiveness in the various skin areas. The tests were read on the basis of 1 plus (erythema ⅝ inch in diameter) to 4 plus (erythema 1½ inch or larger in size).

These fourteen foods were tested ten times in each of the twenty-five patients, thus, 350 tests

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were observed for consistency of skin reactions. There were three types of skin response, the positive, the variable and the negative.

The diagnostic value of these three types of reaction was as follows: (1) There were 199 consistently negative skin tests out of a total of 350 tests. Among these there were 58 known instances of food allergy, thus, the diagnostic error of a negative skin reaction was 29.1 per cent. (2) Of 64 consistently positive tests there were only 17 associated with a probable food allergy. Thus, the diagnostic error of a positive skin reaction was 73.5 per cent. (3) Forty-one food tests were classified as variable responses and of these there were 14 known sensitizations, 23.7 per cent.

Recapitulating, 29.1 per cent of the negative tests, 26.5 per cent of the positive tests and 23.7 per cent of the variable tests were associated with known food allergies. There is little justification in view of this fact to assert that the occurrence of sensitivity is in any way directly related to any type of skin response to test extracts. There was no single instance in which all of the sensitizations were discovered by skin testing.

*Diagnostic Accuracy of Routine Skin Tests.*—The second study is that of an analysis of the diagnostic accuracy of skin tests for these fourteen foods in a series of 659 patients subject to various allergies. The results are illustrated in table 1.

Table 1. *Diagnostic Accuracy of Routine Skin Tests*

Number of Patients	Allergic Syndrome	Percentage Diagnostic Accuracy of Routine Skin Tests
248	Asthma	38.7
105	Perennial nasal allergy	40.4
200	Seasonal hay fever	40.2
28	Migraine	30.7
42	Eczema	33.9
24	Urticaria	18.7
12	Gastrointestinal allergy	20.0

These 659 patients were routinely tested with 171 foods. There was one or more proved allergies for 121 of these foods with a total of 1,780 sensitizations. However, only 77 of these 121 foods gave skin responses for a total of 501 reactions. This gives a diagnostic accuracy of 28 per cent.

The incidence of skin reactions not associated with clinical sensitivity is the most confusing feature of skin tests for foods. In a previous study<sup>1</sup> it was found that out of 4,264 skin reactions there were only 567 with a demonstrable clinical reaction. In this same group of patients there were 1,291 proved food allergies, thus, giving a diagnostic value of skin tests to other procedures in the ratio of 5 to 12.

#### DIAGNOSTIC PROCEDURES IN FOOD ALLERGY

*History Taking.*—History taking in a food sensitive patient may elicit information which will suggest that some of the symptoms are due to foods but it is neither practical nor efficient to attempt to isolate specific food reactors by the history. A patient does not consult a physician because of his

known food allergies, he comes because he is unable to correlate his symptoms with specific foods or because he mistakenly suspects some other cause. If everytime he eats lobster he has symptoms and he is free of these same symptoms when he does not eat lobster he will carry out the necessary treatment without seeking medical aid. It is only possible for a patient to identify those foods to which there is no masked sensitivity and this at once eliminates the regular articles in his diet, foods which experience has shown are the most common cause of trouble. The patient's statement that regardless of what he eats his symptoms are the same cannot be accepted as a fact. He may not have attempted any correlation of ingesta and his reactions and, secondly, the foods causing trouble may be repeated at such intervals as to produce a masked sensitivity.

One should not accept as true a patient's statement that he knows certain articles of the diet are agreeable. On several occasions patients have reported that they "knew for sure" that some foods did not cause symptoms whereas, with correct individual testing, they produced violent reactions. While the history may give some suggestions as to the occurrence of possible sensitization, it is a fallacy to assume it has diagnostic reliability as regards either the occurrence of food allergy or the identification of specific reactors except in those instances in which allergic foods are used occasionally. The history will not reveal cumulative or latent allergies. It may be possible to identify concomitant sensitizations but it would be unusual if one were able to determine any of the thermal factors by the history. The important feature in history taking is the evaluation of the clinical course of symptoms which might suggest food sensitization and at the same time one obtains many helpful factors concerning inhalant contacts. It should not be assumed that the emphasis placed on food studies in this paper suggests any lack of attention to inhalant factors. Similar exhaustive studies concerning these reactors should be made preferably preceding or concomitant with food studies in all instances in which an inhalant sensitization is a possible etiologic factor. This will include certain cases of urticaria, eczema and migraine.

*Diagnostic Methods.*—The initial procedure in studying a patient suspected of food allergy is the use of skin tests. While they do not give conclusive results they are of sufficient value to justify their use. However, they should not be employed as an isolated diagnostic measure. They should be followed by a systematic analysis as follows: (1) know what the patient is eating, (2) know when the patient eats the food, (3) know when the patient has symptoms and the type of reaction, (4) knowing these facts one should carry out if necessary deliberate individual food tests for every food used in the diet, keeping in mind that the purpose of all tests is to devise a diet of known constituents on which the patient remains symptom free.

The practical application of these procedures will be discussed briefly. To know what foods are used is not as simple as it may appear to be. A patient must be instructed in detail concerning various modes of contact with different foods and, further, they must be taught to record by means of a food diary which foods are actually eaten. It is necessary to know the exact composition or else avoid such foods as commercial soups, salad dressings, ice cream, sherbets and cured meats. The most common cause for failure in relieving food sensitive patients whose allergies have been determined is the continued use of such foods. This has been true even when patients have made a sincere attempt to follow instructions, therefore, it is necessary to educate patients and to be sure they actually follow the prescribed diet and that the record kept by them is a verbatim list of the foods eaten.

Secondly, to know when the patient eats the food is important because symptoms will develop shortly after the meal at which the food is taken. If, however, the food is eaten alone then in better than 98 per cent of the instances symptoms will occur within an hour or two and are more likely to commence between eleven and forty-five minutes after eating. This statement is based on observations made on many thousands of individual food tests performed under personal supervision. If the time the patient eats a food is known, one may be able to correlate the symptoms providing it is not a masked sensitivity and, in case such a sensitivity exists, one can determine by the diet record the possible etiologic foods in conjunction with the time of occurrence of symptoms.

The third study requires no particular elucidation except that symptoms usually start as indicated and continue in some degree for from fifty-four to seventy-two hours and in the case of asthma they may last for one hundred and twenty hours following the single ingestion of a food.

The next consideration is the number of individual food tests which should be run. As previously stated the guide in all work is to arrive at a known diet with the patient free of symptoms, therefore, the number of tests may vary from three to fifteen or twenty. Except in occasional cases it has not proved of value to perform as many as fifty or sixty individual studies. Further, there must be a definite line of procedure which will vary with the different patients but in all cases will be determined by a correlation of the diet and symptom records. One never isolates individual food tests as a piece meal study but attacks the diagnostic problem as a whole using concomitantly information gained by tests, clinical observations and diet records, as well as complete inhalant diagnosis and therapy.

The role of specific foods as the causation of allergic symptoms or syndromes can be correctly determined under the following conditions only: (1) the elimination or control of any inhalant factor, (2) a test period using only those foods which have

been studied individually as a possible etiologic factor.

An accurate decision concerning the value of this diet cannot be made unless one is certain that the patient confines his selection of foods to those specified. This requires careful supervision and an exact and infinite knowledge concerning foods. In my experience the most common cause for failure has been the deviation from the specified diet either through carelessness or because of lack of knowledge of possible contacts.

While the determination of the present offending foods is of prime importance there is a second problem of no less practical value, namely, the evaluation of the changing status of food sensitization over a period of time. If this be neglected the end results of a careful initial study may be practically nil. Food allergy for most patients is not static but dynamic, hence, one must be on the alert to prevent the development of new sensitizations and to detect them if they occur. Therefore, the requirements for the care of a food sensitive patient is two-fold, first, to determine the offending foods and, second, to determine and maintain tolerance to these by subsequent analysis of the diet.

#### CLINICAL APPLICATION OF SYSTEMATIC FOOD STUDIES

The clinical application of the routine food analysis outlined in this paper will be discussed briefly.

*Hay Fever.*—Food studies are in order in those patients in whom good results have not been obtained by thorough testing and adequate inhalant treatment. They should prove of great value if the patient is subject to excessive nasal secretions with marked postmeal flareups and with pronounced attacks of hay fever in the middle of the night and also if occlusion of the nares is a common occurrence.

*Perennial Nasal Allergy.*—The classical type of perennial nasal allergy is primarily a disease of food allergy. Of course there are inhalant factors but generally the continuation of this syndrome is on the basis of ingesta and the diagnostic and therapeutic measures are definitely concerned with these factors.

*Nonseasonal Asthma.*—In every patient whom I have seen with asthma during the last eight years there has been one or more foods which caused symptoms. It has been observed that when a patient did not give skin reactions to foods he was usually sensitive to many foods. If the asthma was constant and severe in type without any demonstrable inhalant factor or food reactions, the patient was not only likely to be highly food sensitive but also he became sensitive to new foods easily. No patient should be classified as having an intrinsic type of asthma until the possible etiologic relationship of foods has been individually evaluated. This statement is based on numerous observations several of which will be detailed.

A patient treated under the diagnosis of intrinsic asthma for five years who averaged thirteen injections of adrenalin per day was successfully con-



trolled for thirty-four months requiring but six injections of adrenalin over that period of time. The patient then developed symptoms and a recheck of the diet revealed pork as a cause of asthma. When the reaction occurred the patient confessed the deliberate breaking of the diet over the period of time of recurring symptoms. Since following instructions there has been no return of symptoms or use of adrenalin during the last ten months.

A second patient who had been diagnosed as having intrinsic asthma required twenty-two injections of adrenalin in an eight hour period following the ingestion of milk. This patient's symptoms were controlled following complete study of the diet and only seven injections of adrenalin were required for the relief of symptoms during the first year of observation. Over a period of five years the use of adrenalin has been occasional, being confined to those instances when the diet was broken.

A third patient treated for four years as having intrinsic and infectious asthma was cleared entirely of symptoms by the elimination of three foods. There was no recurrence of symptoms except with deliberate breaking of the diet during the year of observation.

A fourth patient considered as having intrinsic asthma and bronchiectasis who averaged between eight and ten injections of adrenalin per day for three years of previous treatment was relieved of symptoms by the elimination of egg.

It is not implied that all patients with intrinsic type of asthma will be relieved by food studies but it is true that during the last eight years no patient with intrinsic type of asthma has been studied in whom the daily need for adrenalin could not be decreased greatly by dietary means. Dietary studies have been the only form of treatment which has resulted in clinical improvement in this type of patient when previous studies had been confined to skin testing. It would seem justifiable, therefore, to apply such diagnostic studies routinely on all such patients.

Recently Feinberg<sup>2</sup> demonstrated to Rackemann and myself the findings in a patient who had what appeared to be intrinsic asthma secondary to chronic nasal allergy whose symptoms were due entirely to fungi and were clinically controlled by specific therapy.

Sensitization to food is not a question to be answered by interpretation of skin tests. Whether the patient is sensitive to a food or not may be determined by correctly performed individual deliberate feeding tests. These tests should be observed by the physician and not by a nurse or technician alone and they must be interpreted on the basis of the nature and mechanism of food allergy.

#### SUMMARY

The diagnostic value of repeated skin tests using fourteen foods commonly causing allergic symptoms has been studied.

There appears to be little value in repeated skin

tests inasmuch as 29.1 per cent of the consistent nonreactors actually produced symptoms while only 26.5 per cent of the constant skin reactors were associated with allergy and finally that only 23.7 per cent of the variable reactors were proved to be a cause of symptoms. This compares with a diagnostic accuracy of 28 per cent for routine initial testing with these fourteen foods.

A practical systematic plan of food studies has been outlined.

It is suggested that patients with apparent intrinsic asthma should be studied thoroughly for food allergy.

2005 Bryant Building.

#### BIBLIOGRAPHY

1. Rinkel, H. J.: *J. Missouri M. A.* 34:327 (September) 1937.
2. Personal Communication.

## THE ST. LOUIS PNEUMONIA CONTROL PROGRAM

A STATISTICAL EVALUATION OF VARIOUS  
FORMS OF THERAPY

E. SIGOLOFF, M.D.

ST. LOUIS

Pneumonia is a public health problem of major importance in St. Louis. It occupies third place in the list of causes of death. The mortality rate in 1937 and 1938 was fourth highest among cities of 500,000 population or over. In August 1938 the United States Public Health Service designated St. Louis as one of seven centers where pneumonia control programs were to be inaugurated and stipulated that necessary funds be furnished by the Missouri State Board of Health. Immediately thereafter, the Health Division began to draft plans for its first pneumonia control program.

Until the beginning of the program the reporting of pneumonia was inadequate and reliable morbidity statistics were not available. To overcome this, pneumonia, regardless of etiology or clinical classification, was incorporated in the Code of Communicable Diseases and physicians were required to make a special report for each case.

To establish accurate type incidence in the St. Louis metropolitan area, it was necessary to make pneumococcus typing available to the profession. Since the Neufeld-Quellung test was routine in only seven of twenty-five hospitals surveyed, the personnel of the various hospital and private bacteriological laboratories was invited to attend demonstrations of standard recommended typing procedures.

After pneumonia reporting had been made mandatory and convenient typing facilities made available, the St. Louis Pneumonia Control Program was inaugurated. The objectives of the program were: (1) the determination of morbidity, (2) the study of type incidence in St. Louis and (3) the reduction of mortality from pneumonia.

From the St. Louis Health Division.

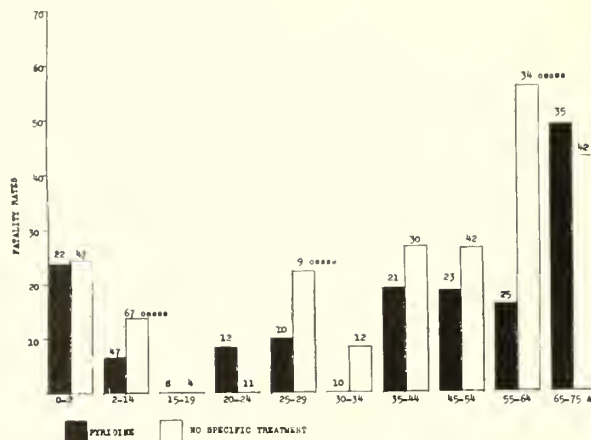


Fig. 1. Morbidity and mortality rates from pneumonia per 1,000 estimated population by age groups.

An analysis of 1,928 reported cases of pneumonia presented in figure 1 showed 1,135, with 283 deaths, to be lobar, and 793, with 470 deaths to be bronchopneumonia. Pneumonia occurred in individuals of all ages but both morbidity and mortality were highest at the extremes of life, i. e., in the age groups below 1 year and 65 to 75 and more. The morbidity rate was high in the age group 1 to 4 but the mortality rate remained low from ages 5 to 19, both rates rising gradually from 20 years upward.

A total of 1,132 sputum specimens were submitted to the bacteriological laboratory for typing. Type specific pneumococci were isolated in 982 (86.7 per cent) confirmed cases of pneumonia and in 63 instances in which the diagnosis had not been established. Single types were obtained from 885 cases and multiple types from 97. The order of frequency in which the types occurred was I, III, VIII, VII, V, IV, VI, II. Types for which serum was released comprised 53 per cent of the total number of cases. A detailed discussion of the epidemiological aspects of the Pneumonia Program is discussed by Dr. S. E. Sulkin of the Health Division (page 435).

#### PATIENTS RECEIVING TYPE SPECIFIC ANTIPNEUMOCOCCIC HORSE AND RABBIT SERUM

During the first year of the program, the Health Division released types I, II, IV and VIII and V and VII antipneumococcus horse serum (Lederle) to residents of St. Louis. Dr. Lawrence Thompson and his associates, working independently of the Health Division, distributed rabbit serum (Lilly) types I, II, V, VII, VIII and XIV. In a group of 166 cases of type specific pneumococcal pneumonia receiving horse serum, 145 recovered and 21 (12.6 per cent) died; of those receiving rabbit serum, 94 recovered and 12 (11.3 per cent) died. The results of these two series have been combined and are presented in table 1.

Although it may be assumed that pneumonia responds equally well to either serum, clinically the use of rabbit serum offers at least two important advantages. First, the incidence of sensitivity to

Table 1. Patients Receiving Type Specific Anti Pneumococcus Horse and Rabbit Serum

Types	Recovered	Died	Deaths Occurring Within 24 Hours or Less	Gross Fatality Rate Per Cent	Corrected Fatality Rate Per Cent
I	120	11	5	8.4	4.8
II	14	3	0	17.6	17.6
IV	12	5	4	29.4	7.7
V	28	3	1	9.6	6
VII	31	3	0	8.8	8.8
VIII	33	7	4	17.5	8.3
XIV	2	1	0	33.3	33.3
Total*	245	33	14	11.8	7.2

\*Includes types I and II, I and III, I and V, I and VIII, and II and V which received two types of serum and were not listed above.

rabbit serum in the population at large is considerably lower than to horse serum. Second, the projected dose of rabbit serum can be given in one injection rather than at intervals, assuring the patient of a maximum amount of antibodies in the shortest possible time.

Of 278 cases of type specific pneumococcal pneumonia receiving either horse or rabbit serum alone, 245 recovered and 33 (11.8 per cent) died. Excluding 13 cases which died within twenty-four hours after serum was administered and one patient who died of cerebral hemorrhage, the corrected fatality rate was 7.2 per cent. In a series of 37 home treated cases receiving serum alone, 35 recovered and 2 (5.4 per cent) died, indicating that serum can be successfully given at home.

Serum was effective in the 0 to 19 age groups. No deaths occurred in 54 cases treated with types I, II, IV, V, VII, VIII or XIV antipneumococcus serum. Of 156 individuals receiving serum in age groups 20 to 54, the period of maximum importance, 139 recovered and 17 (10.9 per cent) died as compared to 40 recoveries and 16 (28.5 per cent) deaths in the higher brackets of life. None of the 14 deaths referred to in table I were excluded from this analysis. The results are presented in figure 2.

In a group of patients treated with pyridine, 68

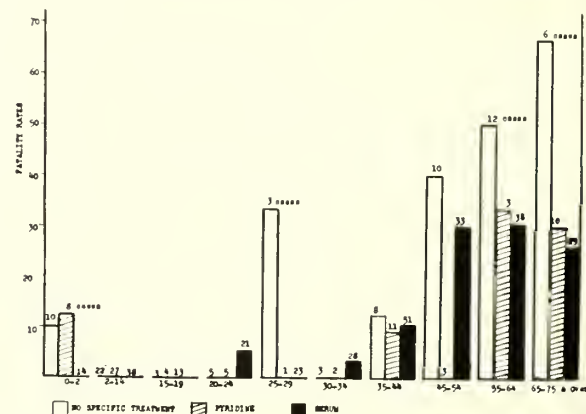


Fig. 2. Comparison of effectiveness of serum, pyridine and no specific treatment in the various age groups. (Types I, II, IV, V, VII, VIII and XIV.) (Serum cases include fifteen deaths occurring within twenty four hours or less after administration of serum.)



recovered and 6 (8.1 per cent) died. Eighty-three individuals received no special therapy, 66 recovered and 17 (21.7 per cent) died. The fatality rate in the series treated with pyridine in age groups 0 to 19, 20 to 54 and 55 to 75 and over were 2.5 per cent, 4.5 per cent and 30.7 per cent respectively in contrast to 4 per cent, 22.2 per cent and 52.6 per cent in the nonchemotherapeutic group. This study showed (figure 2) that specific therapy was effective in reducing the mortality rate from pneumonia. Pyridine exerted its maximum effect in age groups 20 to 54.

Forty-five cases of various types received serum and pyridine (table 2): 39 recovered and 6 died, a

Table 2. Cases of *Pneumococcus Pneumonia* Treated With Serum and Pyridine by Types

Types	Number Recovered	Number Deaths	Fatality Rate (Per Cent)
I	8	1	11.1
II	4	1	20
III	5	1	16.6
IV	6	0	0
V	2	1	33.3
VII	5	1	16.6
VIII	4	1	20
X	1	0	0
XIII	1	0	0
XVII	1	0	0
XIX	1	0	0
XXIX	1	0	0
Total	39	6	13.3

fatality rate of 13.3 per cent. Thirty-two or 71 per cent of the cases, and 5 or 83 per cent of the deaths occurred in the age groups 35 to 75 years and over. Of 34 cases in the series treated with types I, II, IV, V, VII, VIII or XIV serum, 30 recovered and 5 (14.2 per cent) died as compared to a gross mortality rate of 11.8 per cent with serum alone. Of 6 type III cases, 5 recovered, 1 or 16.6 per cent died showing the possible value of this combination in the treatment of type III. Serum and pyridine also proved effective in the home when 4 cases receiving this therapy all recovered.

Only 9 cases received serum and sulfanilamide (table 3); 7 recovered and 2 (22.2 per cent) died.

Table 3. Cases of *Pneumonia* Treated With Serum and Sulphanilamide by Types

Types	Number Recovered	Number Deaths	Fatality Rate (Per Cent)
I	2	1	33.3
II	1	0	0
III	0	1	100
VII	1	0	0
XI	1	0	0
XIX	1	0	0
XXIII	1	0	0
Total	7	2	22.2

One of three home treated cases receiving this combination died.

Of 215 cases of pneumococcal pneumonia of all types treated with pyridine, 177 recovered and 38 (17.6 per cent) died as compared to 230 recoveries and 72 (23.8 per cent) deaths in 302 cases receiving

no special form of treatment. In a series of 39 type III cases receiving pyridine, 26 recovered and 13 (33.3 per cent) died in contrast to 33 recoveries and 16 (32.6 per cent) deaths occurring in individuals receiving palliative treatment, a difference not statistically significant. These results are summarized in table 4. The fatality rate of type III cases was high in both series in age groups 35 to 75 and over.

Table 4. Comparison of the Effect of Pyridine and No Specific Therapy on *Pneumococcus Pneumonia* by Types

Types	Pyridine			No Specific Therapy		
	Number Recoveries	Number Deaths	Fatality Rate (Per Cent)	Number Recoveries	Number Deaths	Fatality Rate (Per Cent)
I	16	0	0	12	1	7.7
II	4	0	0	1	2	66.6
III	26	13	33.3	33	16	32.6
IV	10	1	9	11	4	26.6
V	9	1	10	7	2	22.2
VI	12	1	7.7	19	5	20.8
VII	10	0	0	11	2	15.4
VIII	13	4	23.5	12	7	36.8
IX	6	0	0	6	1	14.2
X	2	1	33.3	3	3	50
XI	2	1	33.3	5	0	0
XII	2	2	50	3	0	0
XIII	2	1	33.3	7	2	22.2
XIV	6	0	0	10	2	16.6
XV	4	1	20	6	1	14.2
XVI	2	0	0	3	2	40
XVII	0	1	100	3	5	62.5
XVIII	1	1	50	4	0	0
XIX	6	2	25	17	1	5.5
XX	2	0	0	3	3	50
XXI	1	0	0	7	0	0
XXII	2	0	0	2	1	33.3
XXIII	4	2	33.3	10	2	16.6
XXIV	4	1	25	2	0	0
XXV	3	1	25	4	0	0
XXVII	0	0	0	4	0	0
XXVIII	0	1	100	1	1	50
XXIX	1	0	0	2	2	50
XXXI	0	0	0	2	0	0
XXXII	0	0	0	1	1	50
Multiple	27	3	10	19	6	24
TOTAL	177	38	17.6	230	72	23.8

Pyridine was given to 77 cases of pneumonia in age groups 0 to 19; 71 recovered and 6 (7.7 per cent) died as compared to 109 recoveries and 9 (7.6

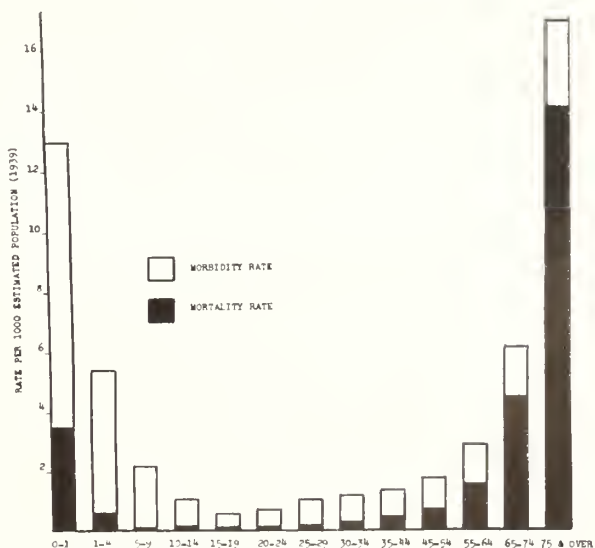


Fig. 3. Comparison of effects of pyridine and no specific therapy on pneumococcus pneumonia by age groups.

per cent) deaths in those receiving palliative treatment, a difference not statistically significant. Pyridine was particularly effective in age groups 20 to 54 and 55 to 75 and over, the fatality rates being 13.7 per cent and 35 per cent respectively in contrast to 21.1 per cent and 48.6 per cent in the no treatment series. (Fig. 3.)

In a series of 45 cases of pneumonia treated with pyridine in which no attempt was made to establish the etiological agent, 33 recovered and 12 (26.6 per cent) died. This demonstrates the importance of typing every suspected case of pneumonia. A number of lives might have been saved by the administration of serum if a suitable type had been isolated.

#### COMPLICATIONS (BACTEREMIA AND EMPYEMA)

Bacteremia occurred in 13.7 per cent of the serum treated cases (table 5). Of 38 cases complicated by

Table 5. *Influence of Age, Specific Therapy and Bacteremia on Fatality Rate From Pneumococcus Pneumonia. Types I, II, IV, V, VII, VIII and XIV Treated With Specific Serum Alone*

Age Groups	Positive Blood Cultures			Negative Blood Cultures		
	Number Recoveries	Number Deaths	Fatality Rate (Per Cent)	Number Recoveries	Number Deaths	Fatality Rate (Per Cent)
0-2	0	0	0	14	0	0
2-14	1	0	0	37	0	0
15-19	1	0	0	12	0	0
20-24	3	0	0	17	1	5.5
25-29	2	0	0	21	0	0
30-34	3	0	0	24	1	4
35-44	3	3	50	42	3	6.6
45-54	3	7	70	20	3	13
55-64	5	4	44.5	19	6	25
65-75 and Over	1	2	66.6	16	4	20
TOTAL	22	16	42.1	223	18	7.4

bacteremia, 22 recovered and 16 (42.1 per cent) died as compared to 223 recoveries and 18 (7.4 per cent) deaths when the blood culture was negative. Serum therapy was quite effective in the younger age groups regardless of the blood culture. The fatality rates rose from age 35 upward, especially in the

presence of a blood stream infection. This also held in negative blood culture cases except that the peaks were much lower.

Empyema was encountered in 25 cases of pneumonia of various types (table 6). It occurred at all ages regardless of the therapy used but was particularly prevalent in type I. The blood culture was positive in 4 cases, 2 of which died.

#### CONCLUSIONS

As a public health project and a social benefit, the St. Louis Pneumonia Control Program has been a success. Each of its three objectives has been attained. Facilities for typing were established in practically all hospitals and a number of private laboratories, assuring the profession of dependable and reliable typing. Valuable data on type incidence was thus obtained. Pneumonia, regardless of etiology or classification, was incorporated in the Code of Communicable Diseases and reporting made mandatory for the first time in the history of the Health Division. Accurate statistics on the incidence of pneumonia have been obtained for at least one year. The program undoubtedly has made the public, as well as the profession, pneumonia conscious. The mortality rate dropped to 70 per 100,000 population, the lowest in the annals of the St. Louis Health Division. It is estimated that at least 100 lives have been saved by the use of new treatments.

Only by noting the effect of treatment on individuals of varying age groups can valid conclusions be drawn. For example, the fatality rate in children and young adults was low regardless of the form of therapy used. If, then, the majority of a series is younger individuals, the gross mortality will be low. Since pneumonia does greatest economic harm in the age group 20 to 54, lowering the mortality rate in this group should be of primary importance. Both pyridine and serum have a favorable effect on patients in these ages as compared to those receiving no special treatment. Type III, because of its frequency in older individuals, will, until such time when an effective drug is found, continue to influence the mortality rate unfavorably.

Typing of the sputum of every case suspected of pneumonia is just as important now as it was in the prepyridine era. The routine use of pyridine, without resorting to typing, cannot be condoned since the patient may recover if a suitable type is isolated.

#### RESULTS

1. Two hundred and seventy-eight cases of types I, II, IV, V, VII, VIII or XIV pneumococcal pneumonia received either horse or rabbit serum. Two hundred and forty-five recovered and 33 died, a fatality rate of 11.8 per cent. When 14 deaths were excluded the net fatality rate dropped to 7.2 per cent.

2. The results obtained by the use of either horse or rabbit serum, when employed under comparable conditions, were found to be similar. The clinical advantages of rabbit over horse serum are in its favor.

Table 6. *Empyema*

Types	Age	Blood Culture	Treatment
I	9	Negative	Serum
I	5	Negative	Serum
I	40	Not done	Serum
*I	55	Negative	Serum
I	46	Not done	Serum
I	2	Not done	Serum
I	23	Positive	Serum
*I	63	Negative	Serum
I	41	Negative	Serum
I	5	Negative	Serum
I	38	Positive	Serum and pyridine
I	7	Not done	Serum and pyridine
I	10	Negative	Pyridine
I	8	Negative	Pyridine
I	1	Not done	None
I	3	Negative	None
I	5	Negative	None
*V	5	Positive	Serum and pyridine
VI	73	Not done	None
VI	8 Mo.	Negative	Neoprontosil
VII	14	Negative	Pyridine
*VIII	64	Positive	Serum
XIX	67	Negative	Pyridine
XX	11	Negative	Pyridine
*X, XXI, XXXI	64	Not done	Broad coverage serum

\*Patient died.



3. Specific therapy was effective in types I, II, IV, V, VII, VIII or XIV pneumonia; no cases receiving serum in age groups 0 to 19 died. Pyridine exerted its maximum effect in age groups 20 to 54.

4. Serum alone or in combination with pyridine can be given successfully in the home.

5. The combination of serum with pyridine was more effective than pyridine alone, but less efficient than serum alone in this series.

6. The fatality rate in 215 cases of pneumonia of all types treated with pyridine was 17.6 per cent as compared to 23.8 per cent in 302 individuals receiving palliative treatment. Pyridine was effective in reducing the mortality rate in age groups 20 to 75 and over. Fatalities in type III cases were high and did not respond favorably to treatment.

7. Bacteremia was a serious complication; the fatality rates rose with the increase in age.

8. Empyema was encountered at all ages regardless of the therapy used and was particularly prevalent in type I.

9. The St. Louis Pneumonia Control Program was considered highly effective since it set up machinery for pneumonia typing, made all pneumonias a reportable communicable disease, furnished valuable mortality and morbidity statistics and played an important role in decreasing the death rate to the lowest figure in the history of St. Louis.

University Club Building.

## THE ST. LOUIS PNEUMONIA CONTROL PROGRAM

### EPIDEMIOLOGICAL ASPECTS

S. EDWARD SULKIN, Ph.D.

ST. LOUIS

Soon after Cooper and her associates<sup>1, 2</sup> reported that pneumococci of Group IV could be divided into a large number of types (IV to XXXII), investigations were begun to determine the frequency of these organisms as a cause of pneumonia. Such an investigation had not been made in Missouri until the present study was initiated.\*

Geographic and climatic conditions often influence the frequency with which pneumococci of various types occur in pneumonia. Variations in type incidence may occur in the same year in different places or even in different hospitals in a single community. During an epidemic, however, a single type may prove unusually prevalent and mortality rates may be influenced by such a predominating type. No consideration is given seasonal variation in the present analysis since the data analyzed was accumulated over a twelve month period (November 1938 to December 1939).

Since pneumococci of the higher types commonly inhabit the nasopharynx of normal individuals,<sup>3, 4, 5</sup>

their significance in pneumonia frequently has been questioned. Some studies have suggested that strains of most of the higher types are of low virulence.<sup>6</sup> It has also been shown<sup>7</sup> that types I, II and III are found in nearly all cases of lobar pneumonia while higher types are associated with secondary and bronchopneumonia. Conversely, many reports<sup>8, 9, 10</sup> indicate that pneumococci of the higher types cause lobar as well as bronchopneumonia both in children and in adults. It is hoped that the data presented in this study will throw some light on the problem.

### TYPE INCIDENCE

During the course of this study, 1,928 cases of pneumonia were reported to the Pneumonia Control Service of the St. Louis Health Division, and a total of 1,132 sputum specimens were submitted to the laboratory section for typing. Type specific pneumococci were isolated in 86.7 per cent of the specimens. Single types were obtained from 885 clinical cases of pneumonia, multiple types from 97. Figure 1 shows the type incidence (in the order of frequency) in the clinical cases of pneumonia as compared with the type incidence in a group (364) of presumably normal individuals. A brief history with reference to pneumonia, colds, tonsilitis and sinusitis was obtained from each normal subject.\*

Nasopharyngeal cultures from normal subjects were handled in the following manner: Swabbings from the upper part of the nasopharynx and both tonsils were cultured in Avery's broth for from 4 to 7 hours at 37 C. Blood cells were removed by centrifugalization at slow speed for about five minutes. The turbid supernatant fluid was then transferred to a 15 cc. centrifuge tube and centrifugalized at high speed for about ten minutes, the supernatant fluid then being discarded. The sediment was examined by the Neufeld-Quellung method.<sup>11</sup> Part of the sediment also was injected into the peritoneal cavity of a white mouse. Peritoneal fluid, withdrawn by means of a sharp capillary pipette, was examined after twenty-four hours. Mice which survived were discarded after five days.

Of 885 cases of pneumonia, type I pneumococci comprised 18.3 per cent of the series. Type III was next in order of frequency with an incidence of 13.8 per cent. Type III also predominated in the group of normal individuals, while type I pneumococci were present in only one instance. This seems to indicate that while type I, when found, may be the true etiological agent, presence of type III should not be considered the causative organism unless associated with clinical and roentgen ray evidence. Although some workers<sup>12, 13</sup> found that type II ranked second or third in frequency, in this series it was eighth, with an incidence of only 3.9 per cent.†

\*The Municipal Visiting Nurses' Section of the St. Louis Health Division cooperated in this study.

†In the three month period (December 1939 to March 1940), not included in this study, Type II ranked third in the order of frequency.

From the St. Louis Health Division.  
\*In August 1938, the U. S. Public Health Service designated St. Louis as one of seven centers where Pneumonia Control Programs were to be inaugurated.

## SIGNIFICANCE OF MULTIPLE TYPES

Figure 2 shows multiple types in 97 cases of pneumonia. In order to establish which organism was responsible for the clinical syndrome, emphasis was placed on the response to type specific serum and upon the finding of the organism in the blood culture. It appeared that type I, when found together with another type, was usually responsible for the pneumonia. Sputum from four patients contained both types I and II and it was impossible to ascertain which organism was the infective agent. On the other hand, two patients had types I and III in the sputum and in both cases a type I organism was recovered from the blood stream, indicating that the type III organism was probably a normal inhabitant and played no role in the pneumonia. In another case, types I and VIII were found in the sputum and the latter type was recovered in the blood culture. The relative infrequency of type I in the normal individual would suggest a possible superinfection with the type I organism which was less invasive than the type VIII.

Of 15 cases showing type III pneumococci together with another type, in only one instance was type III present in the blood stream. Further analysis of the cases showing multiple types indicates that type VIII, on the other hand, when found together with another type is usually responsible for the infection. Of 12 such cases, 7 showed type VIII infections.

Several investigators have emphasized the significance of higher types of pneumococci<sup>14, 15, 16</sup> in

pneumonia. That these types play an important role in the pneumonia problem is shown in the study of Plummer<sup>14</sup> who found more than 50 per cent of 6,545 cases to be of the higher types. The Massachusetts state, New York City and New York state pneumonia control services already have presented figures showing the distribution of the thirty-two types of pneumococcus in the sputum specimens studied; the incidence of higher types is apparent.

## RELATION OF AGE TO INCIDENCE OF PNEUMONIA

Characteristic variations depending upon the age of the patient are relatively constant in pneumonia. According to Cecil et al.,<sup>17</sup> type I predominated in young adults and accounted for 45.5 per cent of cases from 10 to 20 years of age; the incidence decreased as age increased and type I accounted for only 20 per cent of the cases over 60 years of age. The reverse was true of type III; 5.9 per cent of cases were in the 10 to 20 age group and 33.7 per cent of patients were more than 60 years of age.

Figure 3 represents case rates (per 10,000 estimated population for 1939) of pneumonia from the various types in each age group. Relatively few cases of either types I or II occurred in the extremes of life. In type III, however, while few cases were reported in children up to 2 years of age, the incidence increased markedly as age increased. Type VI was a frequent cause of pneumonia among young people while type VIII predominated in the older age groups. The incidence

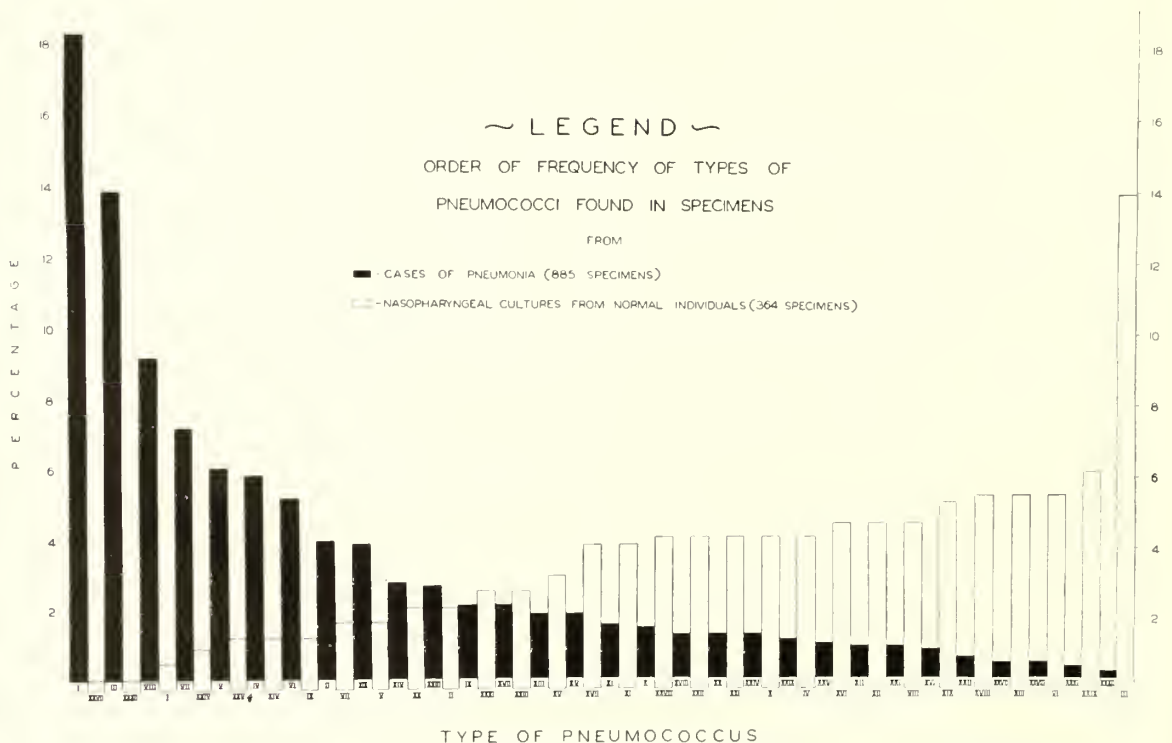


Fig. 1. Order of frequency of types of pneumococci found in specimens from cases of pneumonia and normal individuals.



cent of its total territory, they are responsible for 40 per cent of all births; 75 per cent of all illegitimacy; 41 per cent of all deaths; 52 per cent of all infant deaths; 49 per cent of all maternal deaths; 66 per cent of all delinquency cases; 39 per cent of all diphtheria cases; 64 per cent of all syphilitic deaths, and 47 per cent of all health problem cases.

It is generally known that Negroes show a pronounced susceptibility to pneumonia and to pneumococcus infection in general. Figure 3 clearly shows that this is the case in St. Louis. Of the 1,928 cases under investigation the morbidity rate per 1,000 estimated white population was 1.82 while the rate for the estimated Negro population was 4.90. The relation of age of the Negro patient to the incidence of pneumonia of various types generally corresponds to that of the white patients. As regards sex, pneumonia of all types is usually found with higher frequency among males than females.

That overcrowding favors transmission of pneumococci and tends to increase the incidence of pneumonia is shown clearly in the accompanying maps. The health districts showing the highest morbidity and mortality rates represent the "problem areas" of St. Louis. These sections, which include seven districts in the heart of the city, extend over almost a fifth of the city's acreage and must be traversed to reach downtown offices, factories, stores, theatres and restaurants. These "problem areas," which show the highest morbidity and mortality rates, contain the highest Negro population and the greatest population density in the city. Although they comprise only 34 per cent of the city's estimated total population and only 19 per

A graphic picture of this pattern of concentration with respect to pneumonia is presented in the accompanying maps (fig. 4). The upper map shows the extent to which each district falls above or below the average for all districts in respect to pneumonia morbidity, while the bottom map correlates mortality rates from pneumonia with density of population and percentage of Negroes in the respective health districts. District 13 should be excluded from consideration since the inmates of the St. Louis City Infirmary and the City Sanitarium, which are located in this district, are considered as residents.

Recent studies of Marquette<sup>18</sup> and Benjamin, Rueggsegger and Senior<sup>19</sup> call attention to the relationship between environment and pneumonia.

Benjamin, Ruegsegger and Senior<sup>20</sup> have cited several cases of pneumonia contracted within the family. Their cases, together with the ones presented in this report, sustain the view<sup>21</sup> that a large percentage (20 per cent) of immediate family contacts harbor the homologous strain in the nasopharynx and that a certain number of these individuals actually contract the disease. Cases shown in fig. 5 indicate the possible effects of familial contact. Case R. P., for example, a 12 year old white male, was admitted to the hospital on January 29, 1939, after a nine day illness. A diagnosis of type I pneumonia was made and the child was discharged



on February 6, 1939. Six days after the onset of illness his sister, H. P., aged 8, became ill and was admitted to the hospital on January 31, 1939. A diagnosis of type I pneumonia was made. The child was discharged on February 6, 1939. Several other familial contact cases of pneumonia are presented in the figure.

In a recent survey conducted by Stebbins and his associates<sup>22</sup> in an area in which type V pneumococcal pneumonia was present in epidemic proportions, more carriers of the homologous type of pneumococcus were found than of any other type except type III. These carriers were confined almost exclusively to household contacts to known cases of type V pneumonia. According to these investigators, infection with type I pneumococcus may be widespread in the absence of a high prevalence of type I pneumococcal pneumonia.

That persons who have recently recovered from pneumonia may harbor the organism for a protracted period is indicated by the following cases encountered in this investigation:

Case 1. J. D., white male, aged 24, developed pneumonia on February 21, 1939. Type XVI pneumococci were isolated from the sputum. The patient recovered on March 1, 1939, after an illness of eight days. On April 13, 1939, the same individual again developed pneumonia and again type XVI pneumococci were found in the sputum. The patient recovered on April 22, 1939.

Case 2. H. L., a 46 year old white male, was admitted to the hospital on February 22, 1939, after an illness of two days and a diagnosis of type III pneumonia was made. The patient recovered on March 10, 1939. Several months later the patient again developed a type III pneumonia and recovered after an illness of twelve days.

Case 3. J. M., a 1 year old white female child, was admitted to the hospital on July 29, 1939, after a four day

illness. A diagnosis of pneumonia was made. The type could not be determined because of difficulty encountered in obtaining a proper specimen. The child recovered on August 8, 1939. Two months later, October 23, 1939, the child was readmitted to the hospital after a three day illness. A swabbing from the nasopharynx revealed a type XIV pneumococcus. The child recovered after a brief illness and was discharged from the hospital. On November 20, 1939, the child was again admitted to the hospital and a diagnosis of type XIV pneumonia was made. The patient was discharged on December 19, 1939.

#### DISCUSSION

The classification of pneumococci into serologically specific types has made possible a study of the distribution of these organisms both in patients with pneumonia and in healthy individuals. It has been shown that the pneumonias may differ etiologically although they may be alike in their clinical and anatomical manifestations. The significance of this distinction has become increasingly important since the advent of serum therapy which is type specific in its action. The terms lobar and bronchopneumonia for classifying clinical manifestations are becoming obsolete and ultimately will be superseded by terms indicating the etiologic agent as type I pneumococcal pneumonia, staphylococcal pneumonia, streptococcal pneumonia. Progress in prophylaxis and therapy will depend upon the universal adoption of such a classification.

The order of frequency of the eight most common types in pneumococcal pneumonia is as follows: I, III, VIII, VII, V, IV, VI, II, comprising 69.3 per cent of the cases. The order of frequency of the most common types in the normal individuals is: III, XXIX, VI, XIII, XVII, XIX, VII, XII, XVI.

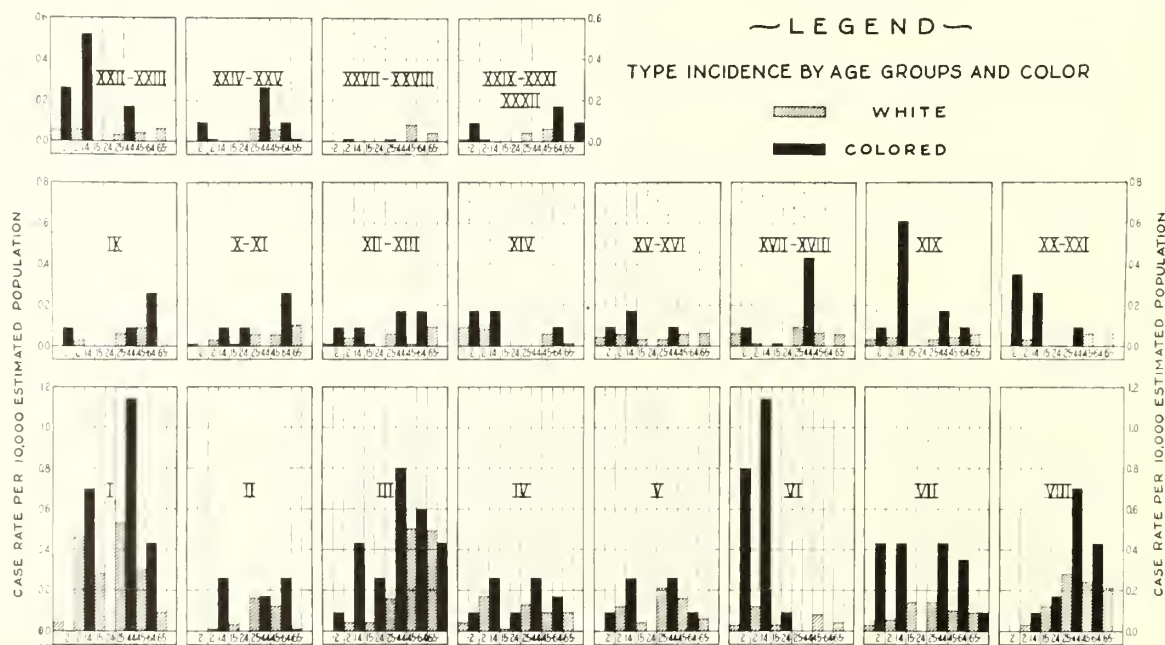


Fig. 3. Type incidence by age groups and color.



Although type III produced the highest death rate, it is the type most generally found in the normal population.

Although pneumonia generally is not regarded as a contagious disease, recent studies<sup>19, 20, 23</sup> support the belief that it is communicable. This is particularly true of type I pneumonia. Patients with pneumococcal pneumonia should be subject to isolation precautions so that spread of infections may be prevented. Since lowered resistance is a predisposing factor to infection special care also should be taken to protect patients in the postoperative state and those with debilitating diseases from contact with pneumonia patients. Isolation would tend to decrease the number of dangerous carriers in the community and prevent cross-infection in the hospital.

#### CONCLUSIONS

1. The epidemiological data presented in this report involves 1,928 cases of pneumonia reported to the Pneumonia Control Service of the St. Louis Health Division.

2. The order of frequency of the eight most frequent serologically specific types in pneumococcal pneumonia was I, III, VII, V, IV, VI, II.

3. The following types of pneumococci (in order of frequency) were found in specimens from the group of normal individuals investigated: III, XXIX, VI, XIII, XVIII, XIX, VIII, XII.

4. Multiple types were found in 97 cases. Types I and VIII, when found together with another type, were usually the cause of infection. Type III when found together with another type, however, was responsible for infection in only one of fifteen cases.

5. There appears to be some relationship between age of individual and type of pneumococcus encountered. Some types predominated in younger age groups, while others were largely confined to patients of more advanced years. Throughout the study Negroes showed higher susceptibility than white. Males appeared more easily infected than females.

6. Overcrowding favors transmission of pneumonia and tends to increase the incidence. This is especially true in St. Louis as shown by the rela-

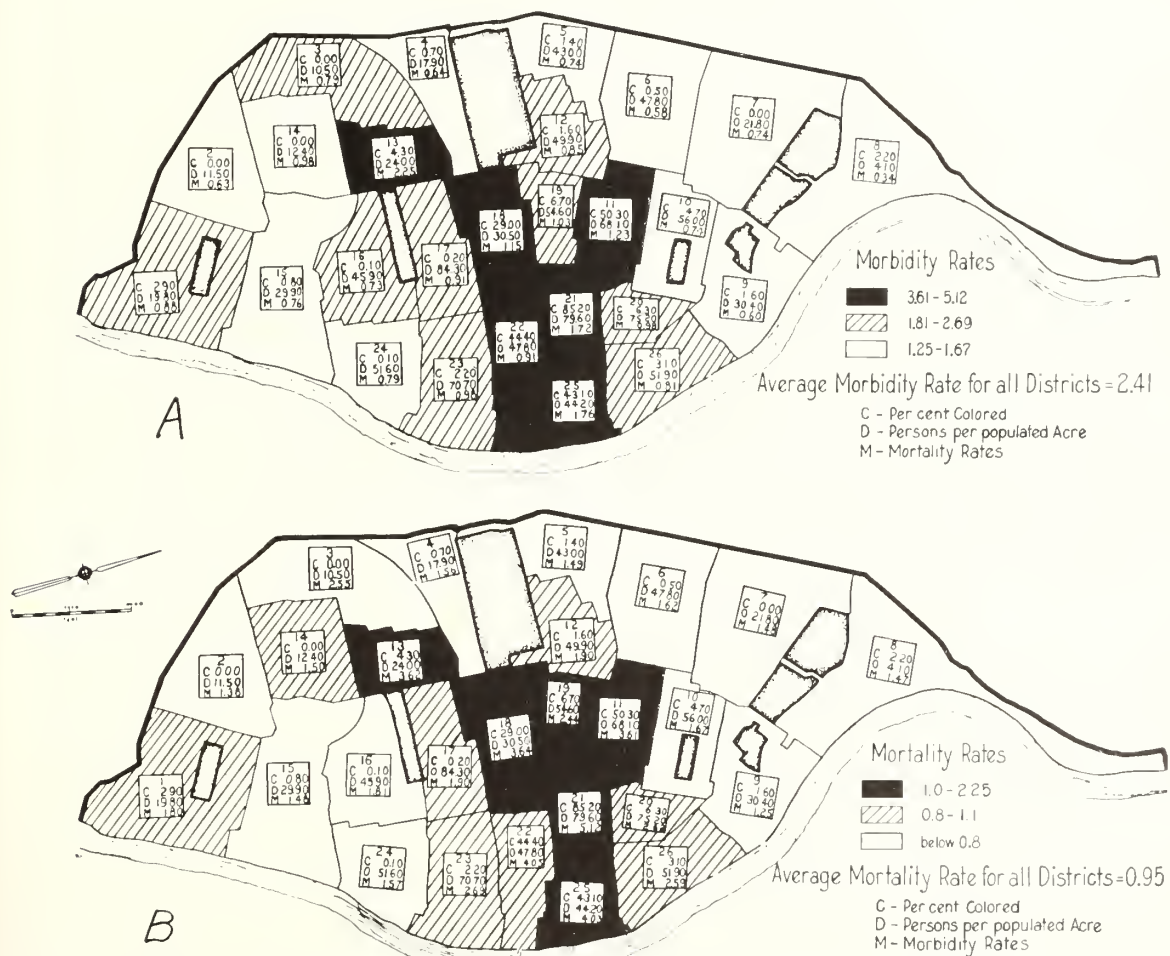


Fig. 4. Morbidity and mortality rates from pneumonia per 1,000 estimated population. A. Correlating morbidity rates with density of population and percentage of Negroes in the respective health districts. B. Correlating mortality rates with density of population and percentage of Negroes in the respective health districts.

Name	Relation	Age	Sex	Color	1938	1939	February	March	April	May
R. P.	Brother	12	M	W						
B. P.	Sister	8	F	P						
D. M.	Daughter	3	F	W						
G. M.	Mother	25	F	W						
D. L.	Daughter	4	F	C						
R. L.	Father	27	M	C						
A. E.	Son	7	M	W						
W. E.	Mother	41	F	W						
F. M.	Son	24	M	W						
W. M.	Mother	58	F	W						
W. B.	Wife	70	F	W						
C. B.	Huband	72	M	W						
J. S.	Father	63	M	W						
W. S.	Son	30	M	W						
G. N.	Brother	52	M	W						
C. N.	Sister	46	F	W						
A. O.	Mother	39	F	C						
W. C.	Daughter	13	F	C						
R. M.	Brother	2	M	C						
A. R.	Brother	5	M	C						
R. P.	Brother	2	M	W						
T. P.	Sister	2	F	W						

■ Original Case of Pneumonia. ▨ Familial Contact Case of Pneumonia  
 Roman Numerals Represent Pneumococcus Type; Bars Indicate Interval of Illness

Fig. 5. Familial contact cases of pneumonia.

tionship of density of population to morbidity and mortality rates.

7. Since the disease may be considered communicable, patients with pneumococcic pneumonia should be subject to the same isolation precautions followed successfully in other contagious diseases.

Municipal Courts Building.

Note: It is a pleasure to acknowledge the cooperation of Dr. Joseph C. Willett and the staff of the laboratory section of the St. Louis Health Division. I am grateful to Dr. Hyman I. Spector, Assistant Health Commissioner, for his untiring interest in the program, and to Dr. Joseph F. Bredeck, Health Commissioner, for making this study possible.

#### BIBLIOGRAPHY

- Cooper, G.; Edwards, M., and Rosenstein, C.: The Separation of Types Among the Pneumococci Hitherto Called Group IV and the Development of Therapeutic Antiserums for These Types, *J. Exper. Med.* **49**:461, 1929.
- Cooper, G.; Rosenstein, C.; Walter, A., and Peizer, L.: The Further Separation of Types Among the Pneumococci Hitherto Included in Group IV and the Development of Therapeutic Antiserum for These Types, *J. Exper. Med.* **55**:531, 1932.
- Sulkin, S. Edward: The Epidemiology of Pneumonia. Distribution of Types of Pneumococci in Specimens From Four Different Groups of Individuals, *J. Missouri M. A.* **37**:280 (July) 1940.
- Schleifstein, J.: Distribution of Types of Pneumococci in Specimens From Normal Individuals and From Patients Having Pneumonia, *New York State J. Med.* **38**:1, 1938.
- Harris, A. H., and Ingraham, H. S.: Study of Carrier Condition Associated With Type II Pneumonia in Camp of Civilian Conservation Corps, *J. Clin. Invest.* **16**:41, 1937.
- Gundel, M., and Wasu, C.: Die Bedeutung der Virulenz des Erregers für die Pathogenese Menschlicher Pneumokokkenkrankungen, *Ztsch. f. Hyg. u. Infektionskr.* **112**:436, 1931.
- Gundel, M., and Schwartz, F. K. T.: Über die Typendifferenzierung und Epidemiologie der Gruppe X der Pneumokokken, *Ztsch. f. Hyg. u. Infektionskr.* **113**:498, 1932.
- Sutliff, W. D., and Finland, M.: The Significance of the Newly Classified Types of Pneumococci in Disease, *J. A. M. A.* **101**:1289, 1933.
- Bullowa, J. G. M.: The Reliability of Sputum Typing and Its Relation to Serum Therapy, *J. A. M. A.* **105**:1512, 1935.
- Bullowa, J. G. M., and Wilcox, C.: Incidence of Bacteremia in the Pneumonias and Its Relation to Mortality, *Arch. Int. Med.* **55**:558, 1935.
- Neufeld, F., and Etlinger-Tulczynska, R.: Nasale Pneumokokkeninfektionen und Pneumokokkeninfektoren im Tierversuch, *Ztsch. f. Hyg. u. Infektionskr.* **112**:492, 1931.
- Avery, O. T.; Chickering, H. T.; Cole, R., and Dochez, A. R.: Acute Lobar Pneumonia. Prevention and Serum Treatment Monograph, Rockefeller Institute for Medical Research, 1917.
- Park, W. H.; Bullowa, J. G. M., and Rosenbluth, M. B.: The Treatment of Lobar Pneumonia With Refined Specific Antibacterial Serum, *J. A. M. A.* **91**:1503, 1928.
- Plummer, N.: The Use of Serum in the Treatment of the Higher Types of Pneumonia, *J. A. M. A.* **11**:694, 1938.
- Finland, M., and Tilghman, R. C.: Clinical and Immunological Observations in Cases of Pneumococcus Type V Pneumonia Treated With Specific Antibody, *New England J. Med.* **215**:1211, 1936.
- Rosenbluth, M. B., and Block, M.: Pneumonia Due to Type V Pneumococcus, *Arch. Int. Med.* **60**:567, 1937.
- Cecil, R. L.; Baldwin, H. S., and Larsen, N. P.: Clinical and Bacteriologic Study of 2,000 Typed Cases of Lobar Pneumonia, *Arch. Int. Med.* **40**:253, 1927.

18. Marquette, B.: Housing and Health Relationships Re-examined, *Public Health Reports* **55**:547, 1940.

19. Benjamin, J. E.; Rueggesser, J. W., and Senior, F.: The Influence of Overcrowding on the Incidence of Pneumonia. Paper delivered at the Conference of the American Medical Association, St. Louis, May 1939. (To be published.)

20. Benjamin, J. E.; Rueggesser, J. M., and Senior, F. A.: Cross Infection in Pneumococci Pneumonia, *J. A. M. A.* **112**:1127, 1939.

21. Smillie, W. G., and Leeder, F. S.: Epidemiology of Lobar Pneumonia, *Am. J. Public Health*, **24**:129, 1934.

22. Stebbins, E. L.; Perkins, J. E.; Rogers, E. S.; Champlin, R. D., and Ames, W. R.: Prevalence of Pneumococcus Carriers: Specific Types in Epidemic and Non-Epidemic Areas, *Am. J. Public Health*, **30**:349, 1940.

23. Spector, H. I.: Pneumonia. Recent Advances in Diagnosis, Treatment and Pub. Health Control, *J. Missouri M. A.* **35**:467, 1938.

## TWENTY-EIGHT YEARS WITH ETHER

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The purpose of this meeting is to discuss certain phases of the most dangerous specialty in medicine today so far as immediate life and death are concerned. After thirty years of observation, I am convinced that 80 per cent of the deaths that occur in the operating room are due to bad anesthesia rather than to bad surgery. Yet, in face of this it is the most abused specialty in medicine today. Today there are those in and out of the specialty of anesthesia who have never learned that there is a vast difference between giving a good anesthetic and putting someone to sleep.

Twenty-eight years ago while I was a senior in medical school, I was called from the class to administer an ether anesthetic to a 9 year old boy for a circumcision and hydrocele operation. The child survived and I was proud of my record. As time went on I became more and more interested in anesthesia because I fully realized what an important role good anesthesia played in successful surgery. In my first nine years of general hospital work, before entering private practice, and in the twenty years of private work, I have administered more than 6,000 anesthetics. Eighty-five per cent of them have been ether; hence, the title of this paper "Twenty-Eight Years With Ether."

Of these cases, the oldest was a man aged 84 who had a one stage complete prostatectomy who lived for seven years, then died of pneumonia. The youngest was a child 24 hours old who was operated on for a cerebral hernia and survived. In all this time I have seen two patients die on the table. One was in a cesarean operation. The patient was in bad condition before the operation and died from exsanguination on the table. The other was a case of obstructed bowel of four days' duration. His condition was bad and his only possible chance to live was by an operation to relieve the obstruction. While the surgeon was freeing the postoperative adhesions which were producing the obstruction the patient suddenly collapsed and died. I can honestly say that neither died on account of the anesthetic.

Presented before the St. Louis Society of Anesthetists, March, 1939.



I believe the best results from ether anesthesia are obtained when the patient enters the hospital forty-eight hours before the operation. In the first twenty-four hours he is given a cathartic (not too severe) and allowed a liquid diet with milk and water given freely. On the second day he rests and is given quantities of liquids. On the evening before the operation he was given a warm cleansing enema. He is given no breakfast the morning of the operation but liquids freely up to three hours before the operation. At least one hour or even two hours before the operation, morphine and atropine are given by hypodermic well under the skin. For a normal 150 pound adult, morphine sulphate gr.  $\frac{1}{4}$ , atropine sulphate  $\frac{1}{150}$  is the usual dose. After the hypodermic the patient is allowed to rest quietly and is then transferred to the operating room where there should be no undue disturbance.

I do not care especially for hyoscine before operating nor barbiturates as their actions are rather uncertain and sometimes create dangers. They are not analgesics but hypnotics. Hence, the patient may be quite sleepy, yet sensitive to pain. I have seen this demonstrated by the surgeon making the skin incision too soon.

After the patient is on a comfortable operating table, examine his heart and lungs and take his blood pressure, if necessary in your opinion. Assure the patient you are not going to choke him and that you are going to take good care of him throughout the operation. Be as kind and considerate of the patient as possible and he will take the anesthetic more easily.

I have found that in children, if one asks them to count and counts with them it takes their mind from the anesthetic and they go to sleep much easier.

A moistened towel is placed securely over the patient's eyes, being careful not to injure the eye and being sure that the eyelids are well closed. The ether mask covered with from twelve to sixteen layers of gauze (depending on the size of the gauze mesh) is placed and ether drops started. Hold the mask at first about two inches from the face and gradually lower it as the patient becomes unconscious. When he is well into or just past the first stage, the mask rests on the face and the ether is dropped at the rate of about sixty to seventy drops per minute. If the patient should start to cough, remove the mask for a minute and let the patient have a breath or two of air, then gradually resume the anesthesia. When the patient is well asleep and relaxed, place a moistened towel about the mask leaving a round opening at the top of the mask about two inches in diameter. This allows about the right air mixture with the vaporized ether. If there is cyanosis, remove the mask and allow air. Cyanosis is a danger sign.

At this time the patient should be placed in the proper position for the particular operation. I think it is necessary for the anesthetist to know the best

positions for the various operations and should supervise the placing of the patient in that position. The anesthetist should watch the preparation of the field of operation carefully for contamination. The anesthetist should wear the same kind of operating room dress as the operator and wash and scrub his hands as does the surgeon. I think it is well for the anesthetist to have a clear view of the operation since at certain stages deeper or lighter anesthesia is required. He should know asepsis just as well as the surgeon.

It is stated that one should be a good anesthetist before he becomes a surgeon, which I think is true; I think also that a man well trained in surgery makes a far better anesthetist.

After the patient has been prepared, well placed and surgically draped for the operation, it is the duty of the anesthetist to cooperate in every way possible to make it as easy for the operator as possible. Nothing in the world is more valuable to a surgeon than a good anesthetist. My advice to any young man who contemplates becoming a surgeon is early in his career to select a doctor who is interested in anesthesia and keep him. Pay him a reasonable reward and he will pay the surgeon a wonderful dividend. I believe it is far more important for the surgeon to have a good anesthetist than to have a good assistant, but I urgently advise him to have both.

I believe that ether has the greatest margin of safety of any general anesthetic. This allows the anesthetist to divert his attention to other things in an emergency. I feel that there is no inhalation anesthetic that gives as good relaxation for deep surgery as does ether. This helps to obviate the necessity for extreme Trendelenburg positions. It has been my pleasure to work with surgeons who do not use the Trendelenburg position even in their deep pelvic surgery because of excellent relaxation in the horizontal position and the abdominal contents are easily packed off from the pelvic organs. For a long, hard piece of surgery there is no position better for the patient than the horizontal position. If extreme shock should occur the head may be lowered a little so that more blood may reach the vital centers, but if this occurs it is better to stop the operation, if possible, and finish at a later date. I like ether, too, because it can be used with safety in so many places. It is safer in the home than explosive gasses. One should be careful of proximity to open flames but electric sparks have never caused any worry with ether. There is that great margin of safety which is so desired when working in the home.

There is no anesthetic as economical as ether. My mask, which I purchased twenty-seven years ago, is still good and 50 cents worth of ether is enough for 80 per cent of all surgical operations. The types of ether masks are not changing every year as are the gas machines. Some of our gas machines today cost from \$500 to \$1,000 or more. In three or four years they are defective or obsolete.

The use of gas, I believe, was the main cause of the introduction of spinal anesthesia because surgeons could not get satisfactory relaxation with gas. I have never become enthusiastic about spinal anesthesia. It is a dangerous operation itself and adds to the already existing surgical pathological condition which is being corrected. I believe that the mortality percentage following gas or spinal anesthesia is greater than that following ether.

Years ago one heard a great deal about ether pneumonia. This is practically nil today in my ether work on account of using fourteen to sixteen layers of gauze on my mask and the careful dropping of the ether rather than pouring it. In the old days with four or five layers of gauze the liquid ether passed directly into the mouth and down the trachea and bronchi and caused a genuine liquid ether inflammation of the lungs. Today with increased gauze on masks, there is a greater surface from which the ether evaporates and the breath keeps the ether fumes warmer inside the mask. It is the ether fumes which are inhaled and not the liquid ether that produces the anesthesia.

Nausea is relatively infrequent if ether is administered properly. In years gone by it was due to improper aeration during the operation, supersaturation of ether, and also to liquid ether passing down the esophagus into the stomach. I believe it is more often a central nausea and vomiting rather than peripheral. Not more than 10 per cent of my cases have prolonged postoperative nausea and these are patients who have had previous operations and were given an anesthetic carelessly. Many times I have been told by the patient how sick they were after their previous operation but have had no nausea or vomiting following my anesthesia. I rarely use a post anesthesia lavage because it has its dangers and I do not find it worth while nor needed. Gas pains are quite infrequent after a good ether anesthesia and in 80 per cent of the cases catheterization is not necessary. This is because the patient has not been overwhelmed with anesthetic and the vital centers have not been paralyzed. About 40 per cent of the abdominal cases require one or two enemas because of gas pains.

Many of my cases have had hypertension of 190 or more, some as high as 240. However, I have had only two cerebral apoplexies following ether anesthetics. One was a hysterectomy in an aged person (74) placed, in this case, in Trendelenburg. She did not recover consciousness fully after the operation and died about seventy-two hours later. The other was an aged person with blood pressure of 200. A pelvic and vaginal operation was done. She awakened with a partial hemiplegia which was definite for a while but cleared up after a time to near normal. In hypertension I prefer ether to any other inhalation anesthetic. It has been my experience that the blood pressure is lowered during a well administered ether narcosis.

Ether conjunctivitis occurs seldom if one is careful and it is easily cared for by a few drops of

sterile mineral, olive or castor oil dropped into the eyes.

Ether given intrapharyngeally through the nasal catheter by means of a vaporizing motor is most satisfactory for mouth, lip and face surgery when one cannot use the mask. These patients are put to sleep by means of the mask and then anesthesia is maintained by intrapharyngeal anesthesia fumes. Most of the harelip and cleft palate operations are in the very young and ether, on account of its safety, works well. Ether vapor anesthesia works well when the operator desires to dissect out tonsils slowly and carefully.

Ether works best of all for rectal surgery for in that one must have profound anesthesia with safety. Deep gas anesthetics have not the margin of safety that ether has.

When a patient has been dangerously deeply anesthetized there is nothing that will revive him more certainly and quickly than a thorough dilatation of the rectum. I much prefer it to the oxygen tank. This means that the rectum is one of the last parts of the anatomy to become narcotized, hence, rectal surgery requires deep anesthesia.

I have never had any bad results from ether when used to anesthetize asthmatic or chronic bronchitis patients. In fact, some of these cases seem quite benefited for a time after an ether narcosis. It is essential in these cases to give the anesthetic slowly and carefully with plenty of gauze on the mask and being sure that aeration is perfect. Use no moist towel at all on the mask.

In acute inflammatory conditions of the pharynx and throat in which there is swelling and edema with a general stenosis of the throat, I like ether when a general anesthetic has to be given. There is far less danger of asphyxiation, and that is what one must guard against in such cases.

Generally speaking, I believe it is the best anesthetic in cases of chronic nephritis with its complications. I have never seen it cause urinary suppression in any case I have anesthetized nor have I seen any bad results from it in cases of operations for pleural empyema.

I have noted many times the equipment which some anesthetists have on their tables such as throat canula, mouth gags and tenaculum for the tongue. I remember one case, a 228 pound patient was operated on for appendectomy. I was forced to place a tension suture in his tongue for traction, but no tenaculum. God forbid such brutality. Always be careful to obtain an easy, perfect aeration and quiet, regular breathing during anesthesia if possible. Gently but firmly keep the angle of the jaw pushed well forward. This keeps the tongue out of the throat and avoids snoring. Snoring means imperfect breathing and leads to exhaustion and shock.

It has been my privilege to use ether with some of the surgeons of St. Louis who are doing lots of cancer surgery. This is the real test of an anesthetist's ability. It is my belief that good cancer



surgery is the hardest surgery of all to do. These cases are usually not the best surgical risks to start with and it takes time to do cancer surgery well and one must spare every ounce of the patient's energy for the postoperative fight. Many of these patients have been on the operating table for more than three hours. These cases have included face, jaw, throat, chest, abdominal, breast, external genital and amputations of extremities with never a fatality in the operating room.

I have used ether in thyroid surgery in which there was cardiac pathology. Never have I been sorry for my selection. I like a hypodermic of morphine and atropine in these cases for the morphine rests the heart, relaxes the patient and reduces the anesthetic. Atropine dries the throat and helps keep the skin dry.

After all one must take into consideration not only the anesthetic agent but also the anesthetist. How much surgery, medicine and physiology does he know? What has been his actual clinical experience? Does he take pride in giving a good anesthesia? If he cares for and takes pride in anesthesia he is likely to be a good anesthetist regardless of what anesthetic he uses. In all my years of anesthesia work it has ever been my desire to give the patient the best possible service I could give. In return, I have expected a reasonable yet substantial reward for my service. One should respect the surgeon always, yet one must recognize, if he has had good surgical training, that the anesthetist is playing an important part in successful surgery. Let us be proud of our specialty, work hard for better anesthesia and a better standard of anesthetists.

I never have believed in nurse anesthetists. In my opinion it is unsound socially, economically and legally. I hope and believe the day will come when all class A medical schools will give a course in practical anesthesia under the supervision of competent doctors of medicine who are really interested in anesthesia. Then the time will be at hand when no one will be allowed to give an anesthetic unless he is legally qualified to sign a death certificate. By being proud of this specialty, it can be improved and placed on the high plane which it so justly deserves.

536 North Taylor Avenue.

Sulfanilamide promptly controlled a case of recurrent lymphocytic choriomeningitis, Harry Leichenger, M.D., Albert Milzer, M.S., and Herbert Lack, M.D., Chicago, report in *The Journal of the American Medical Association* for August 10. This is a condition involving inflammation of a section of the lining of the brain and spinal cord which is characterized by the presence of lymphocytic cells in the spinal fluid.

The case, the authors point out, is of interest for two reasons: first, because of the recurrences, and second, because of the prompt response to sulfanilamide.

"The usual case of lymphocytic choriomeningitis," they explain, is characterized by a single attack of meningeal irritation followed by prompt recovery. Our patient had four distinct recurrences in addition to the initial attack in a period of four months.

## PREMARITAL EXAMINATION LAWS

LEE D. CADY, M.D.

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During the last three years a careful study has been made of more than twenty-five premarital examination laws which were or are now existing in twenty-three states. During the same time, fifty-six bills were studied and watched through various state legislative bodies until they died there.

It has been interesting to observe the different legislative philosophies apparent in the various states and the trend toward greater conservatism and practicability. It seems these changes in legislative motive, so far as premarital examination laws are concerned, are necessary to make them enforceable in the protection of public health.

### OBJECTIVES

It is ironical that strict idealism has little hope for success in this field at the present time. There are some doubts which may be raised as to the legal desirability of purely eugenic motives or to their medical practicability. Eugenic goals may easily be legislated far ahead of medical science and practice, or beyond any desire of the person who wishes to marry or the physician who may make the health certification.

A good example of this form of impractical idealism was the repealed law of Montana. In two short paragraphs were encompassed broad state eugenic functions, more than a medical commission larger than that state legislature itself, could actually accomplish in a month of hard work; and this was supposed (seemingly) to be accomplished in a single examination by a cautious physician laboring under severe penalty for possible errors of omission. The law was repealed by referendum of the people.

Only a limited field of eugenics may be safely included in a compulsory premarital examination. Such diseases as epilepsy, congenital malforma-

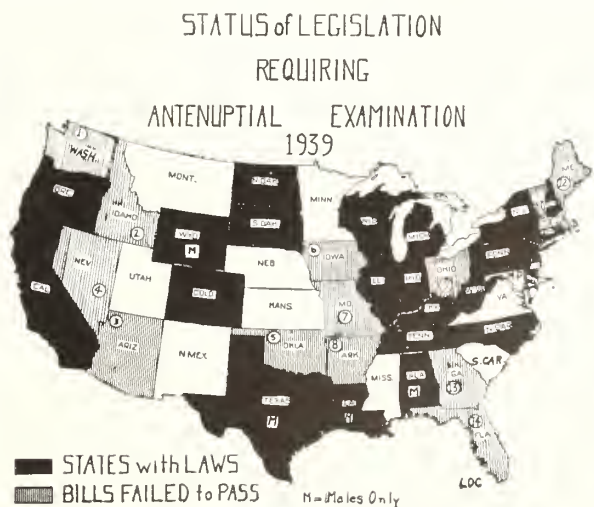


Fig. 1. Status of legislation requiring antenuptial examination. (The new law of Virginia became effective August 1, 1940.)

tions, tuberculosis or insanity must, at present, be left pretty well to the discretion of the parties proposing to marry or to the snap judgment of the lay clerk who issues marriage licences. This is an uncomfortable conclusion, but a law is not practical if the great majority of its subjects are unwilling to comply.

If only those diseases which can be diagnosed quite easily, and which usually may have the applicant's cooperation, are included, they do not appear in the category of venereal diseases. Several states have provisions which include epilepsy, tuberculosis, chronic drug addiction and insanity but there is little enforcement attempted. The burden usually is placed solely upon the diseased person. Such legal provision might be suspected of enactment to allow legal grounds for annulment or divorce. These are not really premarital examination laws.

A study of the table of the antenuptial examination laws shows a pretty complete range of the venereal disease gamut. They vary in requirement from an examination of the male applicant (Texas)

to a required physical examination, a serological test for syphilis and smears for gonorrhea for both applicants (Illinois). Oregon has such a law with additional eugenic provisions and it is greatly evaded. A press release after the first month indicated only two couples had married in the state during that period. Some other states require the gonorrhea examination at the discretion of the physician. (The provisions of the new Virginia law, August 1, 1940, were not known at the time of publication.)

The question thus arises as to further restricting the scope of the examination to the discovery of syphilis if present. To eliminate a compulsory examination for gonorrhea and other venereal diseases, especially since gonorrhea and the others combined have at least twice the incidence of syphilis, may seem like medical heresy. However, the laws requiring only the examination for syphilis are obeyed much better.

It is not yet practical to insist that these compulsory examinations really are meant for the citizen who leaves the state to evade the law. At least two

Table 1. Antenuptial Examination Laws

State	Syphilis	Gonorrhea	Other V. D	Phys. Exam.	Approved Lab.	Time Limit Before Lic.	H. Dept. Adm.	Standard Blood Test	Tb. and Other Dis.	Licensed Phys.	Lic. Void Days	Legal Phys. Fee	Waivers					Free Lab. Tests	Confidential	Remarks Special Provisions		
													Violation Misdemeanor	Non-commun-icable	Pregnancy	Other						
Ala.	✓	✓	✓	✓	✓	15	✓	✓		✓		\$5.00	✓								Male only	'19
Calif.	✓			✓	✓	30	✓	✓		✓				✓	✓	✓	✓	✓	✓			'39
Colo.	✓			✓	✓	30	✓	✓		✓					✓	✓	✓	✓	✓			'39
Conn.	✓			✓	✓	40	✓	✓		✓				✓	✓	✓						'36
Ill.	✓	✓	✓	✓	✓	15	✓	✓		✓	30			✓	✓	✓	✓	✓	✓		Revised 1939	'37
Ind.	✓			✓	✓	30	✓	✓		✓	60			✓	✓	✓	✓	✓	✓			'40
Ky.	✓	✓	✓	✓	✓	15	✓	✓			30			✓		✓	✓	✓	✓			'40
La.	✓	✓	✓	✓		15		✓		✓		\$2.00	✓					✓	✓		Male Only	'24
Mich.	✓	✓	✓	✓	✓	30	✓	✓										✓			Darkfield. Revised	'37
N. Hamp	✓			✓	✓	30	✓	✓		✓				✓	✓	✓	✓		✓			'39
N. J.	✓			✓	✓	30	✓	✓		✓				✓	✓	✓		✓				'38
N. Y.	✓			✓	✓	30	✓	✓		✓	60			✓	✓	✓	✓		✓			'38
N. Car.	✓	✓	✓	✓	✓	14	✓	✓	✓	✓				✓	t			I	✓	May Marry If Treated Eugenic Law Revised 1939	'39	
N. Dak	✓			✓		30	✓	✓		✓	60			✓	✓	✓	✓		✓			'13
Ore.	✓	✓	✓	✓	✓	10	✓	✓	✓	✓		\$5.00	✓	✓			✓	I	✓	Indigents Has Eugenics Board	'38	
Penn.	✓			✓	✓	30	✓	✓		✓				✓	✓			I	✓	Indigents	'39	
R. I.	✓	✓		✓	✓	40	✓	✓	✓	✓	90			✓	✓	✓	✓	✓	✓			'38
S. Dak.	✓			✓	✓	20	✓	✓		✓	20			✓	✓	✓		✓	✓	Darkfield Exam.	'39	
Tenn.	✓			✓	✓	30	✓	✓		✓				✓	✓	✓	✓	✓		Out State Phys. Eligible	'39	
Tex.	✓	✓	✓	✓											✓					Male Only	'29	
W. Va.	✓			✓	✓	30	✓	✓		✓				✓	✓	✓	✓		✓			'39
Wis.	✓	M	M	M	✓	15	✓	✓		✓		\$2.00	✓	✓	✓			✓	✓	M=For Male Only Revised 1937-1939	'13	
Wyo.	✓	✓	✓	✓		10								✓	✓					Male On'y	'31	

Check Mark Indicates Provision Is in Law.



states are attempting to do that (Rhode Island and North Carolina). It will be interesting, indeed, if the police officials of these states actually will round up these quondam fugitive criminals and force blood tests and other examinations upon them after marriage elsewhere.

The "strict" law of Illinois (1937) has been illuminating. People left Illinois for marriage during the first six months in about 75 per cent of cases. The first eighteen months showed a 55 per cent loss. The law was revised slightly in 1939, but on January 22, 1940, a press release indicated 45 per cent of marriages were still being made out of Illinois. There was only 20 per cent evasion in Chicago where a venereal disease educational campaign has been in progress for over two years. The evasion in the rest of the state was still about 70 per cent.

Michigan has a law quite similar to that of Illinois but the gonorrhea examination is left to the discretion of the physician. During the first nine months there was at least a 34 per cent evasion, apparently. A comparable period in 1939 indicated a 30 per cent evasion.

By comparing the "syphilis and gonorrhea" states with a few of the "syphilis" states, it is apparent the latter do not have as much evasion. New Jersey lost 17.8 per cent the first nine months. Rhode Island marriage rates were off 2.7 the first year but only .8 the second. Upstate New York showed a 28 per cent resident marriage loss the first six months.

It is fortunate for graphic representation that the Todd "anti-gin marriage" law went into effect shortly before the premarital examination law. The Todd law requires a waiting period of seventy-two hours after application for license to marry. Graph A shows how a proportionately large number of nonresident brides failed to marry in New York because of the waiting period of seventy-two hours. Graph B shows the same proportionately large number did not marry in New York because of a compulsory premarital examination. Since most state statistics show that about half of the positive blood tests are from women, one may safely presume that rather more than half the usual rate of congenital syphilis in first-born children will be found in these out-of-state marriages.

Connecticut's conservative syphilis law, with sensible waiver clauses for public welfare, was obeyed by 75 per cent the first year (1936) and 88.7 per cent the second year. Its fourth year was a banner marriage year for more than twenty years. This law also shows the desirable effects of permitting non-communicable cases of syphilis, and the "shot-gun" cases to marry under probate court supervision regardless of the results of the premarital examination.

It may be purely coincidental, but it is extremely interesting, that congenital syphilis cases under 1 year reported in Connecticut, have decreased approximately one third from each preceding year for three consecutive years. At the same time births

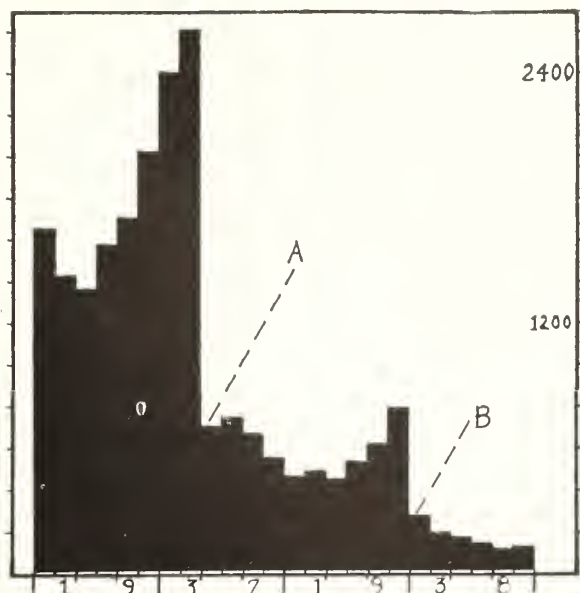


Fig. 2. Licenses to nonresident brides, exclusive of New York City. A. 72 hour waiting period. B. Premarital examination law.

have increased about a thousand each of these years.

These comparative figures make it appear that a law requiring a blood test for syphilis, with certain special exceptions, will be obeyed by the great majority from the beginning. Regardless of the personal and public health desirability, however, people evade gonorrhea examinations. When this requirement is combined with the usual examination for syphilis, too great a number leave home states to marry. This is a serious indictment for gonorrhea clauses.

The Illinois and Michigan laws were amended promptly by inserting waiver provision during the first legislative assembly after their enactment. It seems probable that they will be further amended. Dr. H. J. Shaughnessy, Division of Laboratories, Illinois Department of Public Health, in a personal communication, writes his opinion: "... Tests for gonorrhea prior to the issuance of a marriage license (should) be repealed. My reasons for taking this stand are as follows: (1) Applicants for marriage object to this part of law more strenuously than to the requirement for blood tests. (2) Physicians find great difficulty in taking smears from some virgin females and from the uninfected males, who of course have no discharge, unless they resort to prostatic massage. (3) The laboratory diagnosis of gonorrhea is notoriously unsatisfactory excepting in acute cases of the disease. It is particularly valueless in the chronic disease in the female. (4) Practically no one applies for a marriage license while in the acute stage of gonorrhea. Consequently, the only cases coming to examination are those in which the laboratory tests are of little value. (5) Finally, the significance of the gram negative extracellular diplococci resembling gonococci in persons present-

ing any clinical evidence of gonorrhea, especially in apparently virgin females, presents a problem which we do not believe can be solved in the light of our present knowledge of the bacteriology of the genital tract.

"The very small number of positive findings does not seem to me to warrant the expense and trouble which this part of the law entails, especially in view of the fact that for every positive case which is detected several must be missed when only single specimens are required."

#### IMPORTANT PROVISIONS

Further essentials of a practical premarital examination law, for each applicant, appear to be as follows: (1) a standard blood test for syphilis, done by a laboratory approved by the Department of Health; (2) the blood test should be made from ten to thirty days before application for marriage license; (3) physical examinations by duly licensed physicians should be obligatory in cases with venereal disease who may wish to marry in spite of positive or doubtfully positive blood tests for syphilis; (4) provisions to permit marriage of syphilitic in-

dividuals when they are (a) noncommunicable, (b) pregnant, (c) when both man and woman are infected and the woman is past the childbearing age, and (d) when the probate court assumes function to protect public welfare in the above or other contingencies; (5) exemption from provisions of the law for both parties to a death-bed marriage; (6) duly licensed physician's certificates and reports of approved laboratories of other states should be acceptable for nonresident certification; (7) the usual penalty clauses for violation of the law or of privileged communication should be included; (8) provisions to place the administration of the law under the authority of the State Health Department, and (9) provision must be made for adequate administrative funds.

#### LABORATORY APPROVAL

When the state may demand by law that people have certain laboratory procedures done which may affect their own health and happiness profoundly, there is also a moral and legal obligation for the State to guarantee a reasonable accuracy of the laboratory tests. At least, many lay and medical

Table 2. State Health Officer Comments. January 1919

State	Effective Date of Law 1919	Data Mos.	Total Blood Tests	No. Pos. for Syph.	Per Cent Pos.	Is Law Satisfactory?	Public Pressure to Revise Law?	Marriage Loss Per Cent	Remarks
Ala.	Male Only	—	—	—	—	—	No	—	No Statistics
Calif.	9 19 39	2 <sup>1</sup> / <sub>3</sub>	15,994	226	1.41	Yes	"	—	Dept. Help. Pass Law
Colo.	10 10 39	2 <sup>1</sup> / <sub>3</sub>	2,494	34	1.4	"	"	Loss	
Conn.	1-1-36	48	—	—	1.0 ±	"	"	Not 4th Yr.	Less Cong. Syphilis
Ind.	1940	—	—	—	—	—	—	—	
La.	1924	—	—	—	—	No	—	—	Obsolete
Mich.	1937	—	—	—	—	Yes	No	Loss	G. C. Exam. When Ind. Considered Defective
N. Hamp.	Rev. 1939	21	—	—	1.4	"	"	—	
N. J.	1938	14	13,026	89	0.68	"	"	—	
N. Y.	1938	9	42,949	624	1.4	"	"	17.8	
N. Car.	1938	6	36,459	541	1.5	"	"	Slight	6 Mo. 1938
N. Dak.	1939	11	—	—	?	?	"	—	Law Needs Changes No Data
N. Dak.	1913	—	—	—	—	Yes	"	—	
Ore.	Rev. 1939	13	?	?	2.0	No	Yes	Loss	
Ore.	1938	13	?	?	2.0	No	Yes	Loss	
Pa.	5 17-40	—	—	—	—	—	—	—	
R. I.	1938	20	—	—	1.3	Yes	No	-2	
S. Dak.	1939	6	—	—	1 to 2	"	"	—	
Tenn.	7-1-41	—	—	—	—	—	—	—	
Tex.	1929	—	—	—	?	No	Yes	No	
W. Va.	Male Only 1939	6	—	—	4.0	Yes	No	—	
Ky.	1940	—	—	—	—	—	—	—	
Ill.	1937	11	140,320	2,516	1.8	No	Yes	50	Repeal G. C. Clause
Wis.	Rev. 1939	—	?	?	.8	Yes	No	-11.3	
Wis.	M. 1913	—	—	—	—	Yes	No	—	
Wyo.	Rev. '37-'39	—	—	—	—	No	Yes	—	
Wyo.	1931	—	—	—	—	No	Yes	—	
Total	Male Only	—	251,222	4,030	—	11 Yes 5 No	14 No 4 Yes	—	
	Average	13	—	—	1.56	—	—	Yes	



people hold this view. However, laboratory approval or standardization is only one of the many ramifications of the premarital examination subject.

Two years ago a prolix, an all inclusive, proposed bill for licensing laboratories and medical technologists was circulated in Missouri to elicit comments. This "straw man" was blasted by all groups concerned, radiologists, serologists, bacteriologists, psychologists, psychiatrists, biochemists, physiotherapists and the nondegree medical technicians. Criticism was coming from national sources within a month. The matter became a floor subject for a national convention. It was quite apparent that laboratory people were in undoubted disagreement with the idea of state licensing. They wanted, they said, necessary improvements in standards and perfection but by evolutionary and voluntary procedures. Such a law might fix ultimate standards lower rather than bring about a generally higher level.

A glance at the premarital law analysis table will reveal that the majority of laws include an approved test for syphilis done by a laboratory approved by the State Board of Health. Since there are no state laws which license serological laboratories in the sense we are considering, this approval must be effected largely by test agreement on exchanged blood specimens. There seems to be nothing particularly objectionable when such laws require "a standard blood test for syphilis, performed by a laboratory approved by the Department of Health."

It is serious, however, if no laboratory check is included since there will be in Missouri, for example, approximately 80,000 annual blood tests under a premarital examination law. If there were a prenatal blood test law, too, between 60,000 and 70,000 more tests would be added, making about 140,000 annual tests for preventive purposes.

The most common positive rate for premarital blood tests in various states is about 1.4 per cent. In Missouri, at the same rate, will be found about 1,120 cases of syphilis annually. Reliable prenatal blood test rates are not yet known but the positive rate probably will be more than 2 per cent, probably more than 1,200 cases. The dragnet of laboratories, therefore, must be intrusted to find approximately 2,400 positive blood tests for these purposes alone. Since probably two thirds of these cases will each almost surely cause at least one more case of syphilis within the first year if left undiscovered and untreated, about 1,600 new cases might be prevented by these two laws. These actual and potential cases of syphilis, about 4,000 each year, are important enough to be certain laboratories are doing clinically accurate work.

#### CONCLUSIONS

At the present stage of social, legal and medical development, it is impractical to include gonorrhea clauses in compulsory premarital examination laws.

It is practical to require compulsory premarital

examination blood tests for syphilis provided waiver clauses for public welfare are included in the law.

The administration of premarital examination laws should be placed within the authority of the State Department of Health.

462 North Taylor.

#### DECLARES HARDENING OF THE ARTERIES BIGGEST FUTURE MEDICAL PROBLEM

Arteriosclerosis, the hardening of the arteries which threatens all persons over 50 years old, is the vastest of all medical problems of the future as well as the most neglected, Irving S. Wright, M.D., New York, declares in *The Journal of the American Medical Association* for September 14.

With the average length of life prolonged to over 60 years, he points out, such a disease condition becomes of increasing importance. There are definite degenerative changes present somewhere in the arterial trees of practically all individuals over the age of 50, thus making possible the onset of arteriosclerosis. "Of the population over 50 years of age," Dr. Wright says, "60 per cent (15 million) will die of some cardiovascular-renal syndrome (set of symptoms referable to the heart, blood vessels and kidneys) whereas only 9 per cent will die of cancer. A very large but as yet undetermined portion of that 60 per cent will die as a result of degenerative changes of the arteries, with the cardiac (heart), renal (kidney) or other syndromes merely the results of secondary ischemia (local and temporary deficiency of blood) or hemorrhage.

"As these syndromes frequently produce prolonged and painful disability before death, a change in philosophical approach might well be considered. Perhaps the mere prolongation of life should no longer be sought as the highest goal but rather longevity only to such a degree as it is compatible with happiness and a full life free from pain and invalidism.

"The medical schools for the most part give woefully inadequate training in the study and care of arteriosclerosis. Too frequently the practicing physician fails to recognize its manifestations until gangrene has occurred. The public cares little for what it considers the vagaries of old age, although all who achieve old age are liable to them. Too few research workers have engaged in its study, to a large extent because of lack of endowment. Truly, it has been a neglected field in proportion to its importance."

#### OBSTRUCTION OF ARTERIES OF A KIDNEY CAUSES HIGH BLOOD PRESSURE

Evidence that high blood pressure is the result of obstruction of the arteries of a kidney is presented in *The Journal of the American Medical Association* for September 14 by Nelson W. Barker, M.D., and Waltman Walters, M.D., Rochester, Minn., who cites five cases in which the blood pressure returned to normal after the affected kidney was removed.

The pressure has remained normal for some months in four of the patients; in the fifth case sufficient time has not elapsed since operation to make a definite statement, the authors say.

In further support of their contention, Drs. Barker and Walters state: "In twenty-six, or 45.6 per cent, of a series of fifty-seven cases in which a diagnosis of chronic atrophic inflammation of a kidney was made by x-ray study there was an elevation of blood pressure. In twenty-four cases in which chronic atrophic inflammation of a kidney was diagnosed after its surgical removal fifteen, or 62.5 per cent, showed an elevated blood pressure and eleven, or 45.8 per cent, definite hypertension."

# THE JOURNAL

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OCTOBER, 1940

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## EDITORIALS

### THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.
2. The allotment of such funds as the Congress may make available to any state in actual need for the prevention of disease, the promotion of health and the care of the sick on proof of such need.
3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.
4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.
5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.
6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.
7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.
8. Expansion of public health and medical services consistent with the American system of democracy.

### MEDICAL PREPAREDNESS

At a meeting of state chairmen of the Committee on Medical Preparedness in Chicago on September 20, a representative of the United States Army stated that in the event of war the government would depend upon the American Medical Association for information to be used in filling the necessary medical personnel for the Army. The American Medical Association is compiling a card file giving all information that the Army would need from the questionnaires that have been sent to all physicians in the United States. The Army representative explained that an officer of the Army would be assigned to the American Medical Association headquarters for this duty.

The American Medical Association is to provide a card giving information on each physician and in the case of physicians who have not returned questionnaires these cards will have to be made up from information available in the offices of the American Medical Association. This information is meager compared with the information that can be gained from the questionnaires and cannot give full qualifications or preferences of individual physicians. Therefore, it is absolutely necessary that a 100 per cent return of questionnaires be made that information available may be complete and accurate and also that physicians may have the privilege of stating their preferences and qualifications.

Secretaries of county medical societies are urged to accept the responsibility for the return of all physicians residing in their counties. The questionnaires should be returned regardless of the age, disability, retirement from practice or present military connections. This data will be tabulated by the Committee on Medical Preparedness from the questionnaires.

In response to a resolution adopted by the Committee on Medical Preparedness at a meeting on July 19, the President of the United States has appointed Dr. Irvin Abell, Louisville, Kentucky, as chairman of an advisory committee on health and medical problems to the National Defense Commission. The Surgeon Generals of the Army, Navy and the Public Health Service are members of this committee.

The Committee on Medical Preparedness reported at the meeting on September 20 that 179,796 questionnaires had been sent out since July 16 and that 99,809 have been returned. Questionnaires are being received at the rate of from 300 to 1,000 a day.

The Seventh Corps Area, which includes Missouri, shows the highest percentage of returns, 69.8. However, Missouri is second to the lowest in returns of the eight states included in the area. Missouri has returned 61.1 per cent of questionnaires while Nebraska, the highest in the area, has returned 88.3 per cent of questionnaires.



Any physician who has not received a questionnaire or has misplaced it can obtain a duplicate by request from the Missouri State Medical Association, 623 Missouri Building, St. Louis.

### SYPHILIS AND GONORRHEA CONTROL

The forty-eight states, four territories and the District of Columbia have been allotted \$5,672,388 in federal funds to aid in controlling syphilis and gonorrhea during the coming year, Surgeon General Thomas Parran of the United States Public Health Service has announced.

Missouri in its venereal disease control program now has fifty-three clinics outside of the two major cities. Of these, nineteen are operated by practicing physicians on a part time basis, seventeen are operated by the district and full time county health officers and seventeen are operated by two full time venereal disease clinicians. These combined treatment facilities have an average monthly case load of 2,303.

During the year 1939 there were reported to the State Board of Health 5,080 cases of venereal disease from Missouri outside of the two larger cities. In 1938 the number reported was 6,194, showing a decrease in 1939 of 1,114. There were 6,293 cases, including the carry over from 1938, admitted to the Health Department facilities during 1939 with 79,424 visits to the treatment facilities.

A special portion of the federal grants to aid states in syphilis and gonorrhea control, amounting to \$458,600, has been allotted to states on the basis of the extent of military and national defense industrial concentrations. Dr. Parran pointed out that this is a first step toward aiding the states in meeting the special problems of venereal disease control which arise in connection with concentrations of armed forces and intensification of industrial activities as an increase in the size of the standing army, an extension of the training areas and the further expansion of defense industries will greatly increase the need for expanded control programs and the necessity for additional funds. The responsibility for prevention of new venereal disease infections among enlisted men lies in the adequacy of the control programs in towns and cities near areas of military concentration and maneuvers.

Funds made available to the states for the control of venereal diseases are allotted under provisions of the LaFollette-Bulwinkle Disease Control Act of 1938. In addition to plans for cooperation with the armed forces, considerations in determining allotments include population, extent of the venereal disease problem and financial needs of the states. Funds allotted on the basis of the population and extent of the problem must be matched by state and local funds. The remainder of the total appropriation will be used to further research in new methods of treatment and diagnosis of syphilis and gonorrhea, for training of personnel, coordination of educational efforts and cooperation with the

states in planning and administration of the Public Health Service program.

### CANCER MORTALITY

The National Cancer Institute recently has completed a statistical review of recorded mortality from cancer in the United States. Public Health Bulletins Nos. 248 and 252 are the first in a series of studies of cancer mortality in this country made from unpublished data made available by the United States Bureau of the Census. The bulletins deal especially with the trend and geographic distribution of cancer mortality in the five geographic sections of the United States from 1920 to 1935 by sex in ten year age groups.

The studies show that the trends of mortality from cancer of various sites as buccal cavity, skin, female genital organs, breast, stomach, liver, peritoneum, intestines and rectum, are different in various sections of the country. Cancer of the buccal cavity has decreased in the Northeast and East North Central sections and has increased in the West Central and South and remained level in the Pacific region. Skin cancer has shown a decline in the Northeast, East North Central and West Central sections and has remained practically level in the South and the Pacific regions.

Rates for all cancer and for internal sites of cancer including stomach, liver, peritoneum, intestines and rectum and other or unspecified organs are highest in the Northeast; the East North Central and the Pacific have much the same rates; the West Central is somewhat lower and the South has the lowest rates. Among the external sites of cancer the rate for cancer of the buccal cavity among southern females, for skin cancer among both males and females in the South and the rate for cancer of the female genital organs in the South are high.

Mortality from all cancer among Negro males is lower than that among white males and lower in the South than in the North. Among Negro females mortality from all cancer is higher than that among white females in both sections and is lower in the South than in the North. The rate of buccal cavity cancer among Negro females, particularly in the North, is high. Skin cancer among both Negro males and females is low and the rate for breast cancer is equivalent to the white rate in both North and South and the rate for cancer of the genital organs among Negro females in both North and South are comparatively high.

### NEWS NOTES

Dr. Jesse E. Douglass, Webb City, and Dr. William M. Kinney, Joplin, will present a paper on "Silico-Tuberculosis" at the Mississippi Valley Conference on Tuberculosis at St. Paul, Minnesota, on October 2.

Dr. O. Jason Dixon, Kansas City, was a guest of the Upper Des Moines Medical Society at Spirit Lake, Iowa, on August 15, and spoke on "An Operative Procedure for the Correction of Deafness."

Dr. Curtis H. Lohr, St. Louis, was made a fellow of the American College of Hospital Administrators at a meeting of that organization in Boston, Massachusetts, September 14 to 16.

The first clinical pathological conference was held at the Ellis Fischel State Cancer Hospital, Columbia, on September 19, at 7:00 p. m. Conferences will be held the third Thursday in each month and all members of the profession and medical students are invited to attend.

Dr. E. H. Skinner, Kansas City, was a guest speaker of the Colorado State Medical Society at Glenwood Springs, Colorado, on September 14, of the Washington State Medical Association at Tacoma, Washington, on September 27, and of the Utah State Medical Association at Ogden, Utah, on September 29.

Dr. Evarts A. Graham, St. Louis, was one of a group of twenty-one who received honorary degrees from the University of Pennsylvania on September 20 and 21 when the school celebrated the bicentennial of its founding. He received the degree of Doctor of Science. Dr. Graham presented an address before the University convocation on "Two Centuries of Surgery." The degree of Doctor of Law was conferred upon President Roosevelt and Sir Lyman Poore Duff, Chief Justice of Canada, and the degree of Doctor of Civil Law upon former President Herbert Hoover at the celebration.

The United States Civil Service Commission has announced examinations to fill two classes of junior medical officer positions (rotating internship and psychiatric resident) at St. Elizabeth's Hospital, Washington, D. C. For the rotating internship applicants must be fourth-year students in a class A medical school and cannot enter until they furnish a certificate showing completion of the medical course prior to June 30, 1941. For the psychiatric resident position, applicants must have completed their fourth year of study in a class A medical school subsequent to December 31, 1937, and have completed a one year rotating internship. The salary for the positions is \$2,000 a year less a retirement deduction of 3½ per cent and a deduction of \$60 a year for quarters, laundry and medical attention. Applications must be filed with the Civil Service Commission, Washington, D. C., prior to October 17. Application forms may be obtained from the Secretary of the Board of United States Civil Service Examiners at any postoffice or from the Civil Service Commission, Washington, D. C.

National Hearing Week will be observed October 20 to 26 by the two hundred chapters of the American Society for the Hard of Hearing. The Society will attempt to acquaint the public with the prevalence and seriousness of total or partial loss of hearing and with the efforts to rehabilitate the hard of hearing adult and to prevent deafness in children. "United for Better Hearing" is the slogan of the week's activity. The St. Louis League for the Hard of Hearing, 4527 Westminster Place, will have open house each afternoon of the week and on October 23 will have a demonstration of hearing aids and various apparatus for the convenience of individuals who are hard of hearing.

Examinations for appointments as commissioned officers in the Medical Department of the Navy will be held January 6 to 9, 1941. The appointments will be for Assistant Surgeon in the Medical Corps of the regular Navy, effective approximately two months from the time of the examination, and for Acting Assistant Surgeon (intern) effective July 1, 1941. Requests for authorization to appear for examination should be submitted to the Bureau of Medicine & Surgery, Navy Department, Washington, D. C., in sufficient time to permit the authorization to reach the applicant prior to December 30, 1940. Applicants for appointments as Assistant Surgeon must be citizens of the United States between the ages of 21 and 31, graduates of class A medical schools and have completed one year of intern training. Applicants for appointment as Acting Assistant Surgeon (intern) are not required to have had previous intern training.

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Nonofficial Remedies:

Endo Products, Inc.

Ampoules Camphor In Oil—Endo, 0.2 Gm. (3 grains), 1 cc.

Ampoules Camphor In Oil—Endo, 0.2 Gm. (3 grains), 2 cc.

Flint, Eaton & Co.

Tablets Sulfanilamide, 5 grains

Lederle Laboratories

Tuberculin Patch Test (Vollmer)

Solution Liver Extract Parenteral—Lederle, 10 cc. vial

Eli Lilly & Co.

Ampoule Solution Liver Extract—Lilly, 15 U.S.P. units per cc., 10 cc. size

Ampoule Solution Liver Extract—Lilly, 2 U.S.P. units per cc., 3.5 cc. size

Wm. S. Merrell Company

Thiamine Hydrochloride—Merrell

Thiamine Hydrochloride Tablets—Merrell, 1.0 mg.

Thiamine Hydrochloride Tablets—Merrell, 3.0 mg.



- Ampuls Solution Thiamine Hydrochloride—  
Merrell, 1.0 mg., 1 cc.  
Ampuls Solution Thiamine Hydrochloride—  
Merrell, 6.0 mg., 1 cc.  
Ampuls Solution Thiamine Hydrochloride—  
Merrell, 10.0 mg., 1 cc.

E. R. Squibb & Sons

Follutein—Squibb

Vials Follutein—Squibb, 500 International  
Units

Vials Follutein—Squibb, 1,000 International  
Units

Vials Follutein—Squibb, 5,000 International  
Units

U. S. Standard Products Co.

Pituitary Solution, U.S.P.

Ampuls Pituitary Solution, U.S.P., 1 cc.

Ampuls Pituitary Solution, U.S.P., ½ cc.

Vials Pituitary Solution, U.S.P., 10 cc.

Vials Pituitary Solution, U.S.P., 30 cc.

John Wyeth & Brother, Inc.

Tablets Sulfanilamide, 5 grains

Tablets Sulfanilamide, 7½ grains

Tablets Sulfanilamide, 10 grains

The following products have been accepted for  
inclusion in the List of Articles and Brands Ac-  
cepted by the Council But Not Described in N.N.R.  
(New and Nonofficial Remedies, 1940, p. ???):

Lakeside Laboratories

Ampules Quinine and Urea Hydrochloride—  
Lakeside, 5%, 2 cc. (for Intravenous Use)

Ampules Quinine and Urea Hydrochloride—  
Lakeside, 1%, 1 cc. (for Subcutaneous Use)

Ampules Quinine and Urea Hydrochloride—  
Lakeside, 1%, 5 cc. (for Subcutaneous Use)

## DEATHS

**Chenoweth, Lincoln C.**, M.D., Joplin, graduate of the  
Missouri Medical College, St. Louis, 1886; Affiliate Fel-  
low of the American Medical Association; honor mem-  
ber of the Jasper County Medical Society and former  
president of the Society; delegate to several Annual  
Sessions; aged 76; died May 5.

**Jose, James E.**, M.D., Jefferson City, graduate of  
Beaumont Hospital Medical College, St. Louis, 1896;  
honor member of Cole County Medical Society; aged  
67; died May 6.

**Vasterling, Paul F.**, M.D., Los Angeles, graduate of  
Washington University School of Medicine, 1883; honor  
member of St. Louis Medical Society; aged 78; died  
June 1.

**Hauck, Louis**, M.D., St. Louis, graduate of Wash-  
ington University School of Medicine, 1880, honor mem-  
ber of St. Louis Medical Society; aged 81; died June 8.

**Trask, Charles D.**, M.D., Kansas City, graduate of  
University Medical College of Kansas City, 1905; honor  
member of Jackson County Medical Society; aged 63;  
died June 14.

**Mendonsa, Lawrence A.**, M.D., University City, grad-  
uate of St. Louis College of Physicians and Surgeons,  
St. Louis, 1906; member and former secretary of the  
St. Louis County Medical Society; aged 59; died July 17.

## BOOKS FOR LEISURE MOMENTS

### THE FIFTH HUMAN RIGHT

Paul de Kruif, dynamic fighter for health adds a fifth  
to the four widely accepted human rights, the right to  
health. In "Health Is Wealth" (Harcourt, Brace and  
Co., New York) he describes the struggles of a small  
coterie of men for the enactment of a different type of  
health law. Its prime purpose is the application to  
human need of proven medical knowledge under the  
aegis of a new federal department; its functional details  
are the province of individual state health departments  
in cooperation with the medical men of the state; its  
insistence is the continuation of the time-proven doctor-  
patient relationship; its insurance is no federalization or  
socialization or regimentation of the medical profes-  
sion.

The volume contains reprints of articles previously  
contributed to the *Country Gentlemen*. The author  
fills out the details, tells the story behind the efforts of  
himself and associates to interest the administration  
and the people in health legislation that would be with-  
out viciousness or patronage. He offers a salutary con-  
tribution to the perplexing problem of disease and  
government. He has been behind the scenes. He points  
out that "the bum's rush from Josephine Roche's health-  
planning brain-trusters" given the representatives of  
the American Medical Association was only a prelude  
to the indictment of the Association itself. He believes  
that there is a middle road, that something can be done  
to improve still further the magnificent health record  
which physicians have established for the American  
people.

B. Y. G.

### THE LAW WILL CATCH YOU

The science of toxicology has advanced to the point  
that it can detect the presence of lethal drugs in a body  
in concentration sufficient to cause death. The sleuths  
are adept at discovering who administered the poison  
or who had reason to do so. At least that is the theme  
of a large part of "The Poison Trail" (Hale, Cushman &  
Flint, Boston) by Dr. William F. Boos. It is an interest-  
ing volume which ranges the whole field of poisons, a  
field which has fascinated many men since Socrates  
drank the famous cup.

B. Y. G.

### THOUGHT TRANSFERENCE

Since 1934 a group of parapsychologists at Duke Uni-  
versity under the leadership of Professor J. B. Rhine  
have concerned themselves with extrasensory percep-  
tion, the cognitive sense independent of the known per-  
ceptive abilities. Since 1882 there have been approxi-  
mately 5,000,000 trials of this sense, a million of them  
in the Duke Laboratories. In "Extra-Sensory Percep-  
tion After Sixty Years" (Henry Holt & Co., New York)  
Rhine and his collaborators summarize the entire move-  
ment. The volume will not prove easy reading for the  
average person, so much is it taken up with the elab-  
orate presentation of mathematical theses designed to  
prove the data meaningful rather than the outcome of  
chance. Certain it is that the skeptic will not be con-  
vinced by the present volume. The extrasensory per-  
ceptive ability of the chosen subjects varied widely, not  
only between themselves but from day to day. For  
example, in one set of experiments extending over a  
two month period the achieved score varied between  
2 and 19 when 25 would have been perfect. Neverthe-  
less the volume serves the useful purpose of clarifying  
the position of this research group and affords a fas-  
cinating insight into this newest of the "sciences."

B. Y. G.

## COUNCILOR DISTRICT AND SOCIETY PROCEEDINGS

ASSOCIATE EDITORS: COUNCILORS OF THE  
TEN COUNCILOR DISTRICTS

### COUNTY SOCIETY HONOR ROLL FOR 1940

(UNDER THIS HEAD WE LIST SOCIETIES WHICH HAVE  
PAID DUES FOR ALL THEIR MEMBERS)

#### HONOR ROLL

Chariton County Medical Society, December 5, 1939.

Perry County Medical Society, December 11, 1939.

Camden County Medical Society, December 18, 1939.

Miller County Medical Society, December 20, 1939.

Ste. Genevieve County Medical Society, December 22, 1939.

Clinton County Medical Society, December 23, 1939.

Moniteau County Medical Society, January 8, 1940.

Macon County Medical Society, January 10, 1940.

Dent County Medical Society, January 29, 1940.

Dallas-Hickory-Polk County Medical Society, February 15, 1940.

Barry County Medical Society, February 22, 1940.

Audrain County Medical Society, March 22, 1940.

Webster County Medical Society, March 25, 1940.

Morgan County Medical Society, April 8, 1940.

DeKalb County Medical Society, April 15, 1940.

Newton County Medical Society, April 15, 1940.

Howard County Medical Society, April 16, 1940.

Lincoln County Medical Society, April 26, 1940.

St. Francois-Iron-Madison-Washington-Reynolds County Medical Society, May 2, 1940.

Adair-Schuyler-Knox-Sullivan-Putnam County Medical Society, May 16, 1940.

Bates County Medical Society, May 24, 1940.

Holt County Medical Society, July 8, 1940.

Pulaski County Medical Society, July 8, 1940.

Franklin County Medical Society, July 9, 1940.

Christian County Medical Society, July 19, 1940.

### FIFTH COUNCILOR DISTRICT

W. A. BLOOM, FAYETTE, COUNCILOR

#### Boone County Medical Society

The Boone County Medical Society met at the Boone County Hospital at 7:45 p. m., September 3.

Dr. Eugene M. Bricker and Dr. Theodore Eberhard, Columbia, were made members by transfer from the Callaway County Medical Society.

The applications for membership of Dr. J. E. Allen and Dr. T. M. Turner were referred to the board of censors.

Dr. Henry H. Sweets, Jr., Columbia, from the Pathology Department of the University of Missouri, presented an informal discussion with specimens on "Recent Pathological Specimens." The cases presented were extremely interesting and the informal method of presentation met with the approval of the Society.

M. E. COOPER, M.D., Secretary.

### TENTH COUNCILOR DISTRICT

E. J. NIENSTEDT, SIKESTON, COUNCILOR

#### Cape Girardeau County Medical Society

The Cape Girardeau County Medical Society met at the Colonial Tavern, Cape Girardeau, August 12, with the following present: Drs. C. T. Herbert, Cape Girardeau, president; D. I. L. Seabaugh, Rusby Seabaugh and A. M. Estes, Jackson; Edward Crites, Sedgewickville; P. B. Nussbaum, R. A. Ritter, O. L. Seabaugh, William Oehler, Garland A. Reynolds, Glenn J. Tygett, Frank W. Hall and C. A. W. Zimmermann, Cape Girardeau.

The following resolution presented by the necrology committee upon the death of Dr. Daniel H. Hope was ordered spread on the minutes and a copy sent to the family and one to the Missouri State Medical Association:

WHEREAS, That Great Power which creates and, making no exceptions, takes us, has removed from our midst one of our prominent members and in calling to himself Dr. Daniel Howard Hope he has occasioned a niche of sadness in the hearts of not only his immediate family but in those of his numerous friends who mourn the passing, and

WHEREAS, Dr. Hope's benefits to humanity constitute a priceless portion of this community's wealth, nay even of the whole world's treasure, the saving of life and the restoration of the sick.

"Baptizing with fresh beauty blemished souls,  
And steering men's crushed courage by love's chart  
To light divine, where health's effulgent grace  
Heals shattered spirits seared by fleshly tolls."

Resolved, That the Cape Girardeau County Medical Society, being deeply grieved by the passing of Dr. Hope, tenders to his family our sincere sympathy in their loss and commend them to the care of "The Great Physician" whom Dr. Hope emulated in his life and practice.

The committee on public policy reported on its meeting with the Red Cross relative to the distribution of available funds for medical services to the indigent. A proposition to pay physicians at the rate of 50 per cent of the Society's minimum fee schedule could not be carried out because not enough funds were available. Therefore the Society proposed that so long as the money lasts, the Red Cross pay at the rate of 50 per cent of the fee bill, payment to be made to the Society. Thereafter, the physicians will carry on as they did before the Red Cross and since the time of Hippocrates.

The secretary read a letter concerning medical legislation.

#### Meeting of September 9

The Society met at the Colonial Tavern, Cape Girardeau, on September 9. Members present were Drs. C. T. Herbert, M. H. Shelby, William Oehler, Garland



A. Reynolds, Frank W. Hall, Glenn J. Tygett and C. A. W. Zimmermann, Cape Girardeau; D. I. L. Seabaugh and Rusby Seabaugh, Jackson.

A letter from the National Physicians Committee for the Extension of Medical Service was read and an accompanying six page folder of advertisements shown. The secretary reported that he had inquired the cost of running one of the advertisements in the local newspaper and found the cost would be \$100 which was considered prohibitive for the Society.

Dr. M. H. Shelby reported having received checks from the Red Cross for services rendered indigents by members. It was decided to deliver the checks to the respective physicians who had rendered service and in the future the amounts collected would be deposited in the treasury of the Society from which physicians who had rendered services would be paid only for material advanced and the remainder be kept in the treasury of the Society.

C. A. W. ZIMMERMAN, M.D., Secretary.

## BOOK REVIEWS

**SYNOPSIS OF THE PRINCIPLES OF SURGERY.** By Jacob K. Berman, A.B., M.D., F.A.C.S., Assistant Professor of Surgery, Indiana University School of Medicine, Indianapolis. With 274 illustrations. St. Louis: The C. V. Mosby Company. 1940.

This book was written primarily by a teacher for medical students. The body of the book carries the conquered ground whereas the footnotes carry the correlated facts, physiology and experimental fields. This teacher's third maxim, "That there is no operation that has merit enough to be used on a patient who cannot possibly stand it," deserves serious consideration. There are twenty-three chapters (with illustrations and photographs), one chapter each on the various systems as well as chapters on various infections, shock, hemorrhage, tumors, glands and other subjects. W. R. H.

**THE PHYSIOLOGICAL BASIS OF MEDICAL PRACTICE.** A University of Toronto Text in Applied Physiology. By Charles Herbert Best, M.A., M.D., D.Sc. (Lond.), F.R.S., F.R.C.P. (Canada), Professor and Head of Department of Physiology, etc., University of Toronto; and Norman Burke Taylor, M.D., F.R.S. (Canada), F.R.C.S. (Edin.), F.R.C.P. (Canada), M.R.C.S. (Eng.), L.R.C.P. (Lond.), Professor of Physiology, University of Toronto. Second Edition. A William Wood Book. Baltimore: The Williams & Wilkins Company. 1940. Price \$10.00.

The first edition of this book was published in 1937 and was reprinted four times. The present edition is a reprinting of the second edition published in September 1939. This in itself speaks for the value of the book.

This text was written to enable students to more closely associate physiological principles with clinical practice and to gain a more rational view of pathological processes. More and more scientific medicine is directing its attention to the study of morbid physiology in an effort to solve clinical problems. Reciprocal advantages to the fields of clinical medicine, biochemistry and physiology have brought the fields closer together. With this in mind, the authors have given greater prominence to clinical aspects of physiology than is done ordinarily in a physiology textbook.

In most instances the physiology is preceded by a short account of the morphology of a part, in many instances including its blood and nerve supply. A more lengthy description of the more important fiber tracts and grey masses of the cerebrum, cerebellum and spinal cord is given.

A section on the special senses is included in this second edition. The book is well arranged, divided into sections on the blood and lymph, circulation of the blood, respiration, excretion of urine, digestion, metabolism and nutrition, ductless glands, nervous system and special senses.

More and more clinical practice is becoming allied with, or dependent on, physiology for its progress and a good text on physiology such as this volume is a necessity to the physician today.

F. K.

**MEDICAL NURSING.** By Edgar Hull, M.D., F.A.C.P., Clinical Professor of Medicine, Louisiana State University School of Medicine; Visiting Physician, Charity Hospital of Louisiana at New Orleans; Christine Wright, R.N., B.S., Graduate of Davis-Fischer Sanatorium, Atlanta, Georgia; Instructor of Nursing Arts, Charity Hospital School of Nursing, New Orleans, etc.; and Ann B. Eyl, B.S., Assistant Dietician, Cook County School of Nursing, Chicago, etc. 168 Illustrations, including eleven color plates. Philadelphia: F. A. Davis Company, Publishers. 1940.

This textbook was designed to acquaint the student nurse with disease and its treatment. It presents the broad knowledge of a group of experts. It is written from three different points of view: that of the doctor, of the nurse and of the dietitian. The splendid integration of the course materials should do much to assist in preparing nurses for an intelligent understanding of the preventive and social aspects of nursing.

The authors have made use of a considerable number of photographs, roentgenograms and diagrams to clarify the material. The roentgenograms are especially valuable. Each chapter is preceded by an outline in bold face type and is concluded with a list of collateral readings. The subject matter is presented in well organized units which may be adapted readily to the teaching suggestions of the curriculum guide of the individual school of nursing. This unit plan of subject matter makes for better correlation of the material and utilizes the psychological approach to learning, thus making the material more vital to the student nurse. The section on the nursing care of pneumonia should be of great value and interest.

A conscientious study of this textbook will enable the student to formulate correct standards of medical nursing care.

G. H.

**OBESITY AND LEANNESS.** By Hugo R. Rony, M.D., Formerly Associate in Medicine and Chief of Endocrine Clinic, Northwestern University School of Medicine, Chicago, Illinois, etc. Illustrated with 32 engravings. Philadelphia: Lea & Febiger. 1940. Price \$3.75.

In 1900 v. Noorden presented a comprehensive study on the subject discussed by the present author. Since that time material which has appeared in the literature has not been gathered together so that it may be easily assimilated by the practitioner, who unfortunately is prone to consider the question of obesity and leanness as of cosmetic rather than medical importance. The author of this book goes a long way toward correcting such ideas by his evaluation of the literature on the subject. That there is more to obesity and leanness than the question of calories and heredity must be obvious to even the most casual student of the subject. Those interested in the subject will therefore welcome the rather complete discussions of the various conditions which may lead to or be associated with either leanness or obesity. The treatment of the conditions is discussed in a sane manner without too much prejudice. The book is interesting and well worth the consideration of anyone interested in the question of obesity and leanness.

R. O. M.

**DIABETES.** Practical Suggestions for Doctor and Patient. By Edward L. Bortz, A.B., M.D., F.A.C.P., Associate Professor of Medicine, Graduate School of Medicine, University of Pennsylvania; Chief of Medical Service B, The Lankenau Hospital, Philadelphia, etc. With a Foreword by George Morris Piersol, B.S., M.D., F.A.C.P., Professor of Medicine, Graduate School of Medicine, University of Pennsylvania; Editor in Chief, the *Cyclopedia of Medicine*. Second edition, revised and enlarged. Illustrated. Philadelphia: F. A. Davis Co. 1940. Price \$2.50.

This is a volume in which the scientific information intended for both physician and patient is essentially sound. It is likely to prove elementary for the physician and a bit too complicated for the understanding of the average patient. The illustrations are well chosen.

B. Y. G.

**CLINICAL DIABETES MELLITUS AND HYPERINSULINISM.** By Russell M. Wilder, M.D., Ph.D., F.A.C.P., Professor and Chief of the Department of Medicine, The Mayo Foundation for Medical Education and Research, University of Minnesota, Head of the Section on Metabolism Therapy, Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Illustrated. Philadelphia and London: W. B. Saunders Company. 1940. Price \$6.00.

This book is written in fullest detail by an author who has devoted a greater part of his life to the study of diabetes mellitus. The book is divided into two parts. The first part deals with the normal blood sugar levels and the various physiological alterations that are encountered in the normal individual. Diabetes mellitus is then defined and pathogenesis, course, prognosis and the requirements for effective therapy are all dealt with in fullest detail. Included under the division on therapy the author discusses insulin requirements, diet and miscellaneous therapeutic procedures.

The last half of the first part of the book includes the complications of diabetes mellitus and all the systems of the body. One chapter is devoted to a discussion of hemochromatosis. The last half of the book deals with a thorough discussion of hyperinsulinism with reference to symptoms, course and treatment.

The book is lacking in a discussion of experimental physiology in relation to carbohydrate metabolism and pathological changes occurring in diabetes. These have been omitted purposely by the author and hence only clinical considerations are found in the book. This is an excellent book for the practicing physician.

A. E. U.

**MODERN DERMATOLOGY AND SYPHILOLOGY.** By W. William Becker, M.D., Associate Professor of Dermatology and Syphilology, Kuppenheimer Foundation, University of Chicago, and Maximillian E. Obermayer, M.D., Assistant Professor of Dermatology and Syphilology, Kuppenheimer Foundation, University of Chicago. 461 Illustrations in text, 32 full color plates. Philadelphia, London, Montreal: J. B. Lippincott Company. 1940. Price \$12.00.

Becker and Obermayer have written an excellent modern textbook, easy to read, printed on good paper and illustrated with clear well selected photographs. The chapters on the neurodermatoses, occupational diseases and syphilis are outstanding. Treatment is adequately discussed, the authors omitting all drugs and technics which have not proven effective in their experience.

The authors stress the importance of a "rest regime" in the treatment of the functional dermatoses which are now increasing in number. "This increase," they state, "can be attributed to the accelerating tempo of modern life and the economic depression."

The style of the book is pleasing, the viewpoint fresh and biologic rather than morphologic. This reviewer heartily recommends it for students and general practitioners.

N. T.

**THE ERA KEY TO THE USP XI & NF VI.** Fifth Edition revised by Lyman D. Fonda, Professor of Pharmacy, Brooklyn College of Pharmacy, Long Island University, Newark, New Jersey: The Haynes & George Co., Inc. 1940.

This is a pocket-sized compendium of the large volumes upon which it is based. It contains a brief description of a variety of drugs together with their therapeutic properties and average doses.

B. Y. G.

#### PHYSICIAN DISCUSSES PROPER HANDLING OF INJURIES TO BRAIN AND SKULL

The proper handling of brain and skull injuries resolves itself into three categories, the prevention of infection, the treatment of increased intracranial pressure (in the space between the skull and brain) and the proper management of depressed fractures (in which a fragment of the skull is depressed below the surface), Bernard S. Brody, M.D., New Haven, Conn., points out in *The Journal of the American Medical Association* for September 21.

"The dissemination of opinion concerning the treatment of cranial injuries," Dr. Brody declares, "is important because the automobile has increased enormously the number of such patients for physicians in out of the way places where the services of a neurosurgeon are not readily available."

Statistics show that the majority of patients recover with ordinary bed rest supplemented in some instances by spinal puncture to relieve the intracranial pressure, the doctor says. Those patients with an uncomplicated concussion should be kept in bed for approximately from ten to fourteen days. X-rays of the skull, when needed for medicolegal reasons or otherwise, can be taken when the patient's condition warrants the effort.

A diagnostic spinal puncture should be done at some time within the first week. Any small amount of bleeding which might have been present may be missed after seven days. For patients whose spinal fluid is bloody or whose period of unconsciousness is prolonged, the diagnosis of simple concussion alone is no longer tenable and the period of bed rest must be proportionately longer.

#### MEDICAL REGIMENT MARCHES 3,000 MILES

"The First Medical Regiment, which for eighteen years had been stationed at the Field Service School at Carlisle Barracks, Pennsylvania, arrived in Camp Ord, California, June 28, after having march 3,102 miles in fourteen days," *The Journal of the American Medical Association* for September 21 reports in its Medical Preparedness Section. "The regiment averaged more than 250 miles each marching day and on some days made more than 300 miles. Almost the entire distance was made over U. S. Highway 40, although U. S. Highway 30 was followed through the mountains. The regiment consisted of seven officers of the medical corps and 180 enlisted men under the command of Lieut. Col. Robert P. Williams.

The greatest amount of dreaming is done by persons who are between 20 and 25 years old, Doris W. McCray, Cedar Rapids, Iowa, states in *Hygeia, The Health Magazine*. Dreams increase with the variety and activity of the individual's intellectual life. Students report the heightened frequency of dreams during examinations and intensive school work. Dreaming decreases with age. A dream seldom lasts more than ten minutes.



# THE JOURNAL

OF THE

## Missouri State Medical Association

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### CORONARY VASCULAR DISEASE

J. H. MUSSER, M.D.

NEW ORLEANS, LA.

Coronary disease has been called the doctor's disease. I do not think this statement needs any substantiation. All are familiar with the large number of our confreres and friends who die as the result of coronary occlusion. When the list of doctors who have died, which is published in the *Journal of the American Medical Association*, is scanned to see the causes of death, coronary occlusion strikes one as being by far the most common cause of death. In discussing this problem at a meeting in Shreveport several years ago, the paper was discussed by a Shreveport physician who said that in the previous week over one-half of the deaths of doctors as published at that particular time were caused by coronary occlusion. Every year the *Journal* publishes obituaries of physicians for the preceding year and the causes of their deaths are analyzed. Here is the definite confirmatory evidence that coronary occlusion is without doubt the commonest cause of death among doctors. As this article points out, heart disease is the leading cause of death and has been for many years. Deaths from heart disease numbered 1,585 as contrasted, for example, with 357 deaths due to cancer, the next most frequent cause of death aside from arteriosclerosis with 453 and pneumonia with 370. Breaking down the figures for heart disease it is found that coronary arterial disease, either as thrombosis, occlusion or angina pectoris, numbered 676 deaths as the result of coronary involvement. Endocarditis and myocarditis resulted in 373 deaths and other deaths from heart causes were 534. Many of these were probably coronary deaths as the exact cause was not specified other than "other diseases of the heart." These figures certainly demonstrate most forcibly why the average physician should be interested in coronary disease and why he is not only

interested but fears the possibility of such an event terminating his life.

In considering coronary disease it is well to bear in mind that, strange as it may seem, this clinical entity has been recognized definitely only in the last two decades. The great English cardiologist, James Mackenzie, who died January 25, 1925, did not recognize the condition. He was certainly the best known cardiologist in the English speaking world in the last ten years of his life. Illustrative of the fact that he did not recognize the condition is the statement that Mackenzie died as the result of undiagnosed coronary occlusion of which he had had several attacks prior to his death. He recounts in his great work on angina pectoris the case history of a patient who had, seventeen years prior to his death, severe continuous heart pain for two hours. This pain came on when the subject was at rest. He finally obtained relief by taking 10 grains of veronal, after which he went to sleep. Subsequently it was noted that the anginal pain could be brought on by such factors as walking or eating a large meal. The later history showed that cardiac pain would occur from time to time so that the patient would have to cut down his activities. This brief case history is that of Mackenzie himself. He did not recognize that he had had attacks of coronary closure; he labeled them status angiosus and did not realize that continuous heart pain was due most generally to cardiac infarction. An autopsy was made but his heart was not examined until last year. In the *British Medical Journal* is an account of the autopsy findings. The left ventricle was enlarged and thick walled. In the heart muscle were a few small whitish patches of fibrous tissue but in the anterior wall of the left ventricle there was a patch of fibrous tissue of considerable size and another somewhat smaller area in the posterior wall, midway between the apex and the base. At the extreme base of the heart there was a fresh hemorrhagic infarction. The coronary vessels were decidedly thickened and the lumen was markedly decreased. A pathologist who studied the heart concluded, and these conclusions cannot be contradicted, that Mackenzie had several attacks of closure in the smaller branches of the coronaries, the

Presented at the 83rd Annual Session of the Missouri State Medical Association, Joplin, April 29, 30, May 1, 1940.

From the Department of Medicine, Tulane University of Louisiana School of Medicine, New Orleans, and visiting staff, Charity Hospital, New Orleans.

first probably occurring seventeen years before he died and the last one just prior to his death.

This is an interesting commentary on a disorder which now kills people in middle and late life more frequently than any other one clinical entity. Unrecognized by a great cardiologist whose death was caused by it, coronary occlusion has become an appallingly common disorder in a reasonably few years.

Of course the question is raised immediately, did this syndrome exist in the past? The question can be answered unequivocally, yes. Dr. Doek, in his Billings Lecture before the American Medical Association, said that Osler undoubtedly recognized the condition when he was doing so much work in pathology and he said furthermore the older pathologists recognized cardiac infarction, a condition which clinicians had not diagnosed. Doek, incidentally, was the first man apparently to make the diagnosis antemortem, doing this in 1896. His contribution was not recognized by himself or by others as being particularly important and it became buried in medical archives. To Dr. James B. Herrick of Chicago the medical profession is really indebted for its knowledge of the importance of the syndrome. Dr. Herrick wrote a paper in 1912 in which he pointed out that it was a relatively simple matter to recognize the condition clinically. Dr. Herrick, in the preamble in Levy's book "Diseases of the Coronary Arteries and Cardiac Pain," says, "This paper fell like a dud." It was not until six years later that he again presented to the medical world his observations on this condition. It is quite possible at that time the internist was becoming interested in heart disease, stimulated largely by the anatomic and physiologic studies of such men as His, Keith, Tawara and Gaskell. Consequently Herrick's paper was extensively read and quoted. From then on coronary infarction became a live subject. In this same book Dublin writes that at the Presbyterian Hospital in New York in the decade 1910 to 1919 only seven instances of coronary disease were recognized by the clinician and diagnosed properly. In the next decade there were 454 such diagnoses made in about twice the number of patients observed in the previous ten year period. The pathologists of this institution in the early period in roughly some 1,000 odd autopsies found coronary lesions in 17.8 per cent of the hearts. In the later period 30.4 per cent of the autopsied hearts were shown to have coronary involvement. These figures certainly would make one feel that there has been actually a marked increase in the number of patients having coronary arterial disease. On the other hand, it is equally likely that attention having been called to the importance of the coronary vessels that pathologists examine them more carefully now than had been done previously.

I might add that the American medical profession is not the only continental or national profession whose eyes have focused with interest on the coronary vessels. There is a great deal of material

appearing in English literature and much in the German. In Argentina, Boscio of Buenos Aires has written a monograph which is now a tome of some 755 pages. To this he is constantly adding fresh material.

#### ETIOLOGY

Necessarily I will have to be rather dogmatic in many of the statements that will follow.

The constitutional make-up or heredity certainly is of great etiologic importance. Time and again it is found occurring in families, whereas other familial lines seem to escape. The diabetic person is particularly prone to develop coronary arteriosclerosis. The figures of Nathan show that 41 per cent of his diabetic patients had this condition. Overweight is found associated with the condition; syphilis rarely. The importance of hypertension is still a moot point. Parkinson and Bedford state that in 49 per cent of their patients it was the most common etiologic cause, whereas White and Bland put the figures down as 25 per cent. While hypertension is undoubtedly important, I believe that it has an exaggeratedly high importance in the mind of the average physician. There is no reason at all why a person with normal blood pressure should not have coronary occlusion, and he does have. These people may have coronary vessels which are markedly sclerotic and yet there is little evidence elsewhere of peripheral arteriosclerosis or arteriolar involvement.

I have discussed the frequency of the condition in the medical profession. While it is true that the disease is commonly attributed largely to the white collar group, nevertheless, Levy has found 44 per cent of coronary lesions in 165 necropsies on farmers and skilled workers, whereas among many executives and professional men, 303 in number, only slightly more than one third of them showed coronary disease. I will not debate Dr. Levy's figures but certainly the profession as a whole feels that coronary vascular disease is essentially one to which the higher pressure mental worker is more likely to succumb than the man who labors with his hands.

Another etiologic observation of considerable importance is the predilection of the male sex to this condition. Certainly if coronary occlusion may not be a disease of the higher class, definitely it is a disorder peculiar to men. Parkinson's series show that 93 per cent of his patients were males and the statistics, such as those compiled by the Metropolitan Life Insurance Company, show a ratio of 16 males to 3.5 females.

A recent statistical study by Master et al., reviewing 500 consecutive cases of coronary occlusion from Mt. Sinai Hospital, found two thirds of the attacks occurred between the ages of 45 and 65 and almost one third before the fiftieth year. Thirty-nine patients of these 500 had myocardial infarction before the age of 39. As stated previously, they confirm the general impression that coronary occlu-



sion usually is not fatal to people under 40, whereas the lethality rises sharply in the older age groups. Most of the younger individuals were men and, while the ratio of men to women was 3.4:1, the average age of women was higher than men and diabetes was most frequent in women. Hypertension was an important etiologic factor in the females, whereas in the males it occurred in only slightly more than 50 per cent of the cases. They believe from their study that hypertension is an etiologic factor as its incidence in their series was greater than that calculated for the general population. The role that hypertension plays apparently was that of accelerating the aging processes.

#### PHYSIOLOGY

I should like to dwell on physiology but a passing moment. The left coronary artery is the one most usually involved, the anterior descending branch being the portion affected. This is fortuitous for the physician because the anterior wall of the left ventricle is supplied by this vessel and the secondary confirmatory friction rub can often be heard, whereas if it were the artery supplying the posterior portion of the heart this physical sign would be absent. Because the anterior descending branch of the left coronary supplies a goodly part of the interventricular septum, some of the complications and some of the mechanistic disturbances are most likely to occur as diagnostic features when this vessel is attacked.

#### SYMPTOMATOLOGY

The characteristic pain, the symptoms of shock at the time of the initial onslaught, physical signs and so on are so well known that I will make no effort to elaborate upon them. There are one or two points, however, which I would like to bring out which I think often are neglected. In the first place almost without exception it is possible to obtain from the patient a history of having had anginal attacks. It is true sometimes that these attacks are minimal and only by a stretch of the imagination might be diagnosed as angina in the light of subsequent events. Time and again a patient will volunteer he has had precordial discomfort after exercise, after an emotional attack or after eating too much. Fatigue is also an important, I believe, early symptom. The similarity of coronary occlusion to gallbladder involvement is sometimes remarkably close. I know patients who have been operated on for cholecystitis when they have had coronary disease or who have been diagnosed coronary disease and subsequently found to have gallbladder trouble. The one condition mimics the other at times remarkably closely. As a matter of fact one now concedes that it is likely there is a close relationship between gallbladder disease and coronary vascular disturbances. Dyspnea is another symptom which may not be stressed sufficiently. There occurs from time to time coronary thrombosis in a middle aged individual who has no pain but who does have marked dyspnea. Certainly the

occurrence of severe dyspnea or pulmonary edema appearing out of a clear sky should stimulate the physician to examine the heart carefully.

Then there are the minimal attacks. Undoubtedly these occur and are not recognized. I can think of half a dozen people who had precordial pain lasting for a few hours, just as did Mackenzie, which then went away but in later years the patients had the symptoms of pronounced infarction and at autopsy were found to have scars of previous attacks. This is of some importance I think because it is possible that therapeutic procedures may be too vigorous or too exacting.

#### SUBSEQUENT HISTORY

The patient may die, of course, promptly. He may die a heart death a few weeks later from rapid failure, or he may survive several years and then die of gradual heart failure. At times death may occur within a few weeks as a result of heart block, rupture of the heart or as a result of emboli to the brain, but a goodly proportion of the patients survive the primary attack, undoubtedly many more than is now realized as I have indicated in discussing the minimal symptoms. It is my belief that at least 50 per cent of people survive the first attack for a period of at least five years. The statistics of Conner and Holt deal with those patients in whom the occlusion produced pronounced symptoms. As a general rule it might be said that the younger the age of onset the greater the life expectancy.

#### TREATMENT

The treatment of acute coronary occlusion is in three phases: first, the management of the immediate attack; second, the handling of the convalescent period, third, caring for the patient after he finally is up and about.

The immediate indications are to control pain, restlessness, mental perturbation and shock. Morphine, glucose intravenously, heat and warmth are indicated. Because of the possibility of ventricular fibrillation to those people who have rapid heart action or definite ventricular tachycardia, certainly quinidine should be administered for a period of time at least, in doses of 320 mg. (5 gr.) every three hours, to avoid the lethal complication of fibrillation of the ventricle.

The second phase of treatment has to do largely with rest. Three weeks in bed, completely immobile except for movement of the lower legs to avoid venous thrombosis, is indicated. Three more weeks of gradually increasing movements but still in bed and then ten weeks of restricted activities should follow.

#### CONCLUSIONS

The third phase of treatment, and in conclusion, has to do with what the patient should do physically and mentally. I do not think it is wise following a coronary occlusion to make a man a cardiac cripple, nor is it necessary. Let him take mild exercise such as golf and walking and leading a sane and

sensible life otherwise, avoiding overeating and gaining weight. If it is possible, keep him away from mental stress and avoid psychic upsets, restrictions easy to prescribe but difficult to enforce. Lastly, aminophyllin should be taken almost interminably because it may increase coronary flow. I prefer theocalcin or theominal two or three times a day. This may be theoretic but I believe it is valuable. Lastly watch the patient carefully. If the early signs of heart failure appear, notably increased shortness of breath and ease of tire, rest the patient and restrict his activities.

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## TREATMENT OF NEPHRITIS BY REST

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Rest from work has always been used in the treatment of damaged bones and joints. But immobilization by splinting did not originate because of any theory nor was it based on the results of practical experience; rest was necessary to prevent pain. It is known now that the rest the patient demanded and that the physician was obliged to give was good not only for the immediate relief of pain but also for healing for, in the extraordinary disintegration of Charcot's joints is seen what happens when even slightly injured articulations go on working because the pain signals for rest are blocked by disease in the spinal cord.

Rest is a central principle in the treatment of cardiac failure. Even the use of digitalis is largely a rest therapy since it prolongs diastole. But it should be remembered that efforts to give relative rest to the heart are helped by the fact that the patient himself finds he gets short of breath whenever he gives his heart more work to do by moving about.

In the treatment of renal failure and of renal disease one can have no such help from the patient because there are no pain nerves in the parenchyma of the kidney and overwork induces no immediate reflex discomfort. Here one has to stand on his own feet and if rest is used in treatment one must know how the kidney works, how its work can be lessened and, if one is to be able to induce patients to give their kidneys rest, must be very sure that rest is beneficial.

Work is always the movement of a mass of material against a resisting force. Muscles work when they move a weight against the force of gravity. The heart works when it moves a weight against the force of the peripheral resistance offered by the arteriolar constriction. The kidney works when it moves a weight of fluid from the interior of the tubules into the blood capillaries against the force

of osmotic pressure. In this as in all other cases work can be measured if one knows the amount of material moved and the force against which the movement is made.

The amount of fluid moved by the kidneys is given by the work of Homer Smith and his collaborators<sup>1</sup> which has been confirmed by many independent investigators. They found a carbohydrate, inulin, that was filtered from the blood in the glomeruli and that was neither reabsorbed nor secreted by the tubule cells. When the concentration of inulin is measured in the blood the concentration in the glomerular filtrate also is measured. When the amount of inulin excreted in the urine over a given time is measured, the amount of inulin that has been filtered through the glomerular membrane during that time also is measured. This amount is present in a certain volume of urine in a known concentration. But since there is good reason to know that there has been neither addition nor subtraction of inulin on its journey down the tubules the number of times the inulin concentration in the urine exceeds the inulin concentration in the blood plasma is a measure of the degree by which the glomerular filtrate has been concentrated by reabsorption of water on its way down the tubule. This simple arithmetic forces an unexpected conclusion. One is obliged to believe that in twenty-four hours the kidneys of a man concentrate 180 liters of glomerular fluid to the one or two liters of urine that he excretes during that time. This is an astonishing conclusion because it means that in twenty-four hours a mass of fluid nearly three times the weight of the body must have been moved from the interior of the tubules into the blood capillaries running beside the tubules.

The kidney has to work in order to move this great volume of fluid because the more the urine becomes concentrated by the removal of water from the tubules the greater becomes the force of osmotic pressure against which the water must be moved. It is true that in man the urinary constituents do not behave like inulin, for many are partially or wholly reabsorbed with the fluid that is moved back from urine to the blood and some may be in part secreted, but in the end the concentration of the urine is far higher than the blood and there may be more than a hundred times more urea and creatinine molecules per unit volume in urine than in blood. Now, when a concentrated solution is separated from a dilute solution by a membrane permeable to water, the force of osmotic pressure pulls water through the membrane from the dilute to the concentrated solution; that is to say in the kidney water should travel from the blood to the urine. When one finds that in spite of this physical force the movement of water is in the opposite direction, i. e., from the concentrating urine to the blood, one knows with certainty that the membrane, in this case the tubule, is doing chemical work. The tubule cells are burning fuel and using oxygen to obtain the energy required for this work, and though it is

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only a small part of the total oxygen consumption of the kidney the amount used for concentrating the urine has been measured.<sup>2</sup>

The minimal amount of work that must be done by the kidney has been formulated by von Rhorer.<sup>3</sup> The formula says that the work is the product of two terms. The first term states that the work varies directly as the rate of excretion of the urinary constituents; and the second that it will vary as the logarithm of the number of times by which each urinary constituent is more concentrated in the urine than in the blood. It is evident from the first term that only those substances that are excreted in relatively large quantities can have much effect on the work of the kidney, and since sodium chloride and urea often constitute 90 per cent of all the urinary constituents they alone need at first be considered. But sodium chloride can be eliminated because it is reabsorbed so largely that the concentration in the urine is never far from the concentration in the blood. This means that for sodium chloride the second term is the logarithm of 1 or nearly 1 and as the logarithm of 1 is 0 the work required for the concentration of sodium chloride approaches 0. As a first approximation one is thus left with the work needed to concentrate urea.

These purely theoretical considerations thus eventuate in a practical conclusion: The amount of urea excreted can be decreased to a minimum if patients are taught to take no more protein than is needed for their maintenance.

But an argument of this nature is so abstract that it should not be made the sole ground for therapeutic action in the treatment of glomerular nephritis. More concrete evidence is needed. It is only when one finds that the size of the kidney increases regularly as protein consumption is increased or the work of the kidney is increased by removing part of the renal tissue that the theory thus validated by experiment can be seriously considered as a guide to action.<sup>4</sup>

Even after all the evidence that shows that the size of the kidney is controlled by the work it is called upon to do has been given, just as the size of the heart is determined by its work, there still remains the question as to whether rest from unnecessary work is actually beneficial in a progressive disease like glomerular nephritis. The most direct answer to this question has been given by Farr and Smadel.<sup>5</sup> They produced a disease in rats that resembled glomerular nephritis in that if the animals are untreated the kidney is gradually destroyed and they die in uremia. Farr and Smadel observed that when a diet low in protein was given the lesion often healed completely and there were no deaths. Before that Chanutin<sup>6</sup> had found that when the kidney was reduced to a quarter of its original size by operation rats developed proteinuria, high blood urea concentrations, dilute urine and hypertension; in other words the cardinal signs of glomerular nephritis. These findings have been confirmed and further it has been observed that these

symptoms are removed when these animals with small kidneys are given a diet low in protein content. There is thus agreement between theory and the results of anatomical, physiological and experimental pathological observation. There is no escape from the conclusion that the fate of an injured kidney is largely dependent on the work that is imposed upon it and that if one would give relative rest to the kidney one must prescribe diets low in protein.

In the minds of older clinicians the phrase "low protein diet" awakens unhappy memories of the evil results that thirty years ago used to follow the practice of treating patients with nephritis by telling them not to eat any foods that contained considerable concentrations of protein. But these bad results came from diets that contained inadequate amounts of protein, vitamins and minerals. A low protein diet is not inadequate. It contains on the average 0.5 grams of protein per kilo body weight; but there are patients who need 0.6 grams per kilo and there are others who remain in nitrogen equilibrium on 0.4 grams per kilo. If the caloric intake is adequate and the body weight nevertheless slowly decreases the 0.5 grams per kilo of protein must be increased. It must be a diet in which more than one third of the protein is derived from milk and eggs and the remainder from cereals, vegetables and fruits. It has to be supplemented by vitamin B complex in the form of wheat germ and it is usually necessary to add iron and sometimes calcium and phosphate. This is no easy matter for it involves a quantitative not a qualitative dietetics, and it must be carried out in the doctor's office or in the outpatient department, not in the hospital, because over nearly the whole course of glomerular nephritis the patient should be working and living at home.

One cannot do all of this alone and without help. The least one can get along with is an office nurse who, when the patient first comes, can prepare an approximate estimate of the protein and calories the patient ordinarily takes and who also can use some simple method for an estimate of the amount of protein the patient is losing every twenty-four hours in the urine. Then the doctor, the nurse and the patient should go into consultation and decide on the diet in terms of protein, calories and sometimes salt. It is essential to have the patient understand the reason for this diet because he has to do most of the work and unless he knows he will not long continue. The nurse gives the patient a list of the protein, caloric and salt content of ordinary servings of cooked foods measured by the 10 cent standard cup and spoons and together they work out a sample diet of the required amounts, a diet that is only a modification of what has already been found to represent the patient's food habits. The patient goes home and begins to measure and record all he eats and to sum up the quantities of protein and the number of calories he takes every day. When he returns he brings his diet sheets and every

detail is examined and mistakes corrected. It is a great advantage while this is being done to get a determination of the urea and sometimes the chloride content of the twenty-four hours' urine. There are rapid and simple methods available for use in the doctor's office that require little time and equipment. The advantage is that it gives the patient an objective to reach and the doctor an assurance that can be obtained in no other way.

It is only at the beginning that this is difficult and but few patients object to taking pains. If they are shown a practical way they want to work. When conditions change and there is reason to alter the amount of protein they take, it is only necessary to say so and they comply with ease and precision. Understanding why they are taking this diet and knowing how to do it, they can carry on for years without deviation. It is this sort of collaboration between doctor and patient that is necessary in a disease like glomerular nephritis that lasts for years, decades or a lifetime.

An increase in the proportion of patients in whom the lesion heals completely and a slowing of the progress of the disease with an amelioration of the symptoms in those in whom the disease continues must be demonstrated for the rest treatment of nephritis before it can be accepted as a proved and established therapeutic measure. That has not yet been accomplished although this plan has been used for many years with the help of a large number of patients. In a disease in which there is such a wide variation in the intensity and degree of the lesion the direct and satisfactory test would be to divide all patients into two groups as nearly as possible alike and give the rest treatment to only one of the groups. This is the method of experimental science but one cannot reach conclusions by such simple means. All that can be said is that this method does decrease the symptoms of the disease and improve the health of patients and that there is nothing in present experience that leads one to suppose that rest to the nephritic kidney is not as beneficial to human beings as to rats.

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#### BIBLIOGRAPHY

1. Smith, H. W.: *Physiology of the Kidney*, Porter Lectures, Series IX, University of Kansas Publications, 1939.
2. Dock, W.: *Am. J. Physiol.* **106**:745, 1933.
3. Von Rhorer, L.: *Arch. f. die ges. Physiol.* **109**:375, 1905.
4. Addis, T.: *Tr. Assoc. Am. Physicians* (in press), 1940.
5. Farr, L. E., and Sinadel, G. E.: *Proc. Soc. Exper. Biol. & Med.*, **36**:472, 1937.
6. Chanutin, A., and Ferris, E. B., Jr.: *Arch. Int. Med.* **49**:767, 1932.

"Air attacks have brought civilians into the same danger from air attack as soldiers and so the government has made similar arrangements both for the treatment of casualties and for payments for disablement from injury," the regular London, England, correspondent of *The Journal of the American Medical Association* reports in its September 21 issue. "The scheme for civilians applies to members of civil defense organizations injured while on duty and to all other civilians who depend on their earnings for a livelihood. It also applies to immediate dependents if the war injury is fatal."

## HYPERTHYROIDISM

### SOME HAZARDS IN THE SURGICAL TREATMENT

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The term "hyperthyroidism" generally is agreed to include two definite clinical entities, diffuse toxic goiter and nodular toxic goiter. The various signs and symptoms of these diseases may be so intermingled that a differential diagnosis often is extremely difficult; this is especially true when pre-existing adenomata are present. It is also difficult to differentiate between a mild toxic diffuse goiter and a simple diffuse goiter when the nervous manifestations of the latter are in a neurotic individual with an enlarged thyroid. In these cases, basal metabolic estimations are most helpful. The symptoms of mild hyperthyroidism and neurocirculatory asthenia are so similar that hyperthyroidism cannot be ruled out entirely, even in the presence of a low basal metabolic rate. The only safe procedure is to give these patients adequate iodine therapy for several weeks and observe the progress. If there is definite improvement, stop the Lugols and see if there is a recurrence of symptoms. At times this trial and error program may be the only way to arrive at a correct diagnosis.

There is another small group that often is confusing; the patients present practically all the symptoms of hyperthyroidism yet the basal metabolism is not increased proportionately to the degree of the hyperthyroidism, or the basal even may be within normal limits. By going over their past histories carefully, one often is able to elicit symptoms which suggest strongly that these patients had hypothyroidism for some years prior to the time they developed hyperthyroidism. I have seen twelve such cases and in all thyroidectomy has relieved their symptoms and the basal metabolic rates invariably have remained low, averaging about minus 17 per cent.

All toxic goiter patients should be under the joint supervision of the internist and the surgeon throughout the entire period of observation for it is only by this cooperative management that the operative hazards can be estimated accurately, and the mortality reduced to a minimum; complications can be detected and efficiently dealt with more readily, and the patient can be prepared more intelligently. There are numerous factors that influence the hazard of operation such as the condition of the heart, the age of the patient, an extreme weight loss, a recent acute crisis, a rising metabolic rate, general debility and intercurrent diseases and failure of response to iodine.

The condition of the heart in hyperthyroidism affects the mortality rate more than any other one factor. Auricular fibrillation in itself is not a con-

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traindication to surgery, but the operative risk is definitely higher when it is present. In a recent report Crile states that when auricular fibrillation is present the mortality rate is nearly seven times as high as when it is not present. This is also true of hypertension but to a lesser degree. Patients with cardiac decompensation require strict confinement to bed until all of the edema has subsided. Only rest will restore the compensation in the majority of cases; it has been necessary to give digitalis only in a relatively small group that do not respond satisfactorily. Henry Plummer suggested this in 1925 and the results have justified this policy fully. The operative mortality has been lower and the convalescence has been smoother since digitalis has been omitted.

Age influences the mortality in hyperthyroidism more than is realized ordinarily, for patients past 60 years of age are much more prone to have intercurrent diseases and to show visceral degenerative changes. Not only are the myocardium and kidneys apt to be damaged by vascular changes but these patients also are prone to develop respiratory infections which so often result in pneumonia.

The duration of the disease does not of necessity influence the operative hazard; however, when the hyperthyroidism has been relatively severe, has lasted for several years and the patient's resistance to intercurrent diseases has been depleted, the mortality is increased definitely. Fortunately, many of the long standing cases are comparatively mild and the time element does not influence appreciably the operative risk.

There is a group of late cases with a moderate or relatively high degree of hyperthyroidism that do not respond to iodine therapy. The operative risk in these patients is high and they should have all the preparatory measures continued as long as there is any definite improvement, as manifested either by a reduction in the intensity of the hyperthyroidism or by a gain in weight or general strength. There is an unfounded belief among some physicians that the effect of iodine upon hyperthyroidism is transient and not infrequently patients are operated upon before they have been prepared properly. From eight to twelve days of iodine therapy usually is sufficient to prepare the average patient for operation but considerably longer time is required by others, particularly those who on admission are greatly prostrated from a severe hyperthyroidism. Three or four weeks preparation will give these patients time to regain at least a part of their lost weight and strength and will assure a much smoother convalescence. When strict confinement to bed has been necessary, as it is for cases with cardiac decompensation, operation always should be delayed until the patient has been out of bed for at least a few days. I have found this a good rule to follow for prolonged bed rest is debilitating and these patients are prone to develop postoperative pulmonary complications.

The choice of drugs and the amount used must

be adapted to each individual patient. Young persons with high basal metabolic rates tolerate large doses of sedatives while elderly persons do not. Any drug that depresses the respiration particularly is contraindicated in older patients as incomplete lung expansion may be a factor in the development of hypostatic pneumonia.

In doubtful risks, when iodine has failed to influence the course of the disease, ligation occasionally is performed with the idea of testing the patient's tolerance to surgery prior to performing a resection on one lobe. A multiple stage operation is indicated in all cases of severe hyperthyroidism that have not responded satisfactorily to prolonged preoperative preparation. The two stage resection also is indicated when the goiter is unusually large and firm and has compressed the trachea for resection of both lobes will release the support to the trachea and may be followed by a sudden collapse of the tracheal walls. Other indications are excessive time consumed during the resection of the first lobe due to technical difficulties, and undue loss of blood. The operative risk of lobectomy is definitely less than that of subtotal thyroidectomy for the surgical trauma and chance of technical error attendant on the former is just half that of the latter.

Patients suffering with hyperthyroidism should be taken to the operating room in as calm a condition as is possible for the right mental attitude is often most helpful in attaining the best results. Adequate sedation can be produced by giving sufficient dosage of pentobarbital sodium combined with morphine. Simply taking the patient to the operating room is often a good test of their tolerance; if upon arrival undue nervousness is shown with increasing pulse rate, they should be returned to their room at once as they are not ready for surgery.

The choice and manner of administering the anesthetic are of prime importance, particularly if the patient is not a good surgical risk, for a prolonged inhalation anesthetic is deleterious to the handicapped patient. Local anesthesia alone is not essential and, moreover, it cannot be administered satisfactorily in all cases. A so-called combined anesthetic usually is most successful, that is, local infiltration of the neck with a solution of procaine hydrochloride which is supplemented by a sufficient amount of gas to keep the patient comfortable. By this method a light gas anesthetic is required which lasts only from fifteen to twenty minutes.

Local anesthesia is indicated definitely in all cases of substernal goiter with tracheal obstruction. In operating upon these cases, the greatest care must be given to details. The trachea should be exposed early so that in case a tracheotomy might be indicated it can be done without unnecessary delay. After the superior pole and the attachments of the goiter to the larynx have been divided between clamps, the rest of the gland can be freed readily by gentle finger dissection. Each bleeding

point is ligated as soon as it is clamped, thus avoiding pressure on the trachea from the weight of the hemostats. The smaller lobe should be resected first as this often will release the pressure about the trachea and relieve the dyspnea. All attachments to the gland are divided and ligated from above downward. After ligating the inferior thyroid artery, the substernal projection can be delivered safely if the lines of cleavage between the adenoma and the surrounding tissue are separated carefully with the finger. At times large intrathoracic goiters can be removed without splitting the sternum if the center of the adenoma is removed with a spoon, thus reducing its size sufficiently so that it can be delivered into the neck. With the aid of an electrically lighted retractor, any bleeding points in the cavity can be seen easily and ligated, thus assuring hemostasis and avoiding the necessity of packing. A small rubber tube is placed to the bottom of the cavity which is aspirated daily in order to remove any collection of serum.

The scar is especially important in women. It should be well centered and not unduly long with a slight upward curve to the ends so that it can be easily concealed by a necklace. In order to meet these requirements, a small necklace is placed about the patient's neck the night before operation and the line of the incision is marked accurately with an antiseptic dye called bismuth violet. The operative field can be prepared with ether and mercuriolate without entirely removing the dye. A three inch incision is adequate for the average sized goiter. In turning the flap the dissection is carried well above the larynx so that the pretracheal muscles can be separated by a long vertical incision extending from the larynx to the sternum. This generally gives adequate exposure and it is seldom necessary to cut the sternothyroid and sternohyoid muscles transversely. Should more exposure be required, a partial division of the attachments of these muscles should suffice, thus the nerve supply will be preserved and a disfiguring recession of the neck, due to partial atrophy of these muscles, will be avoided.

The essential technical features of a thyroidectomy consist of (1) the removal of the excessive thyroid tissue with the minimum loss of blood and the least possible trauma to the surrounding tissues, (2) preservation of sufficient gland tissue to maintain the metabolism within normal limits, and (3) strict asepsis. In operating upon a patient that is considered a poor risk, the margin of safety is often very narrow and any slight technical error might prove to be the deciding factor in an unfortunate outcome. With the skilled operator there are only two accidents that are worthy of mention; namely, injury to the recurrent laryngeal nerve and postoperative hemorrhage. Both of these can be avoided only by meticulous care of details.

A wedge shaped resection with preservation of the posterior and mesial portion of each lobe, and the avoidance of exposure of the lateral walls of

the trachea, will minimize greatly the chance of injury to the recurrent laryngeal nerve and also to the parathyroids. The commonest place of injury to the recurrent nerve is on the lateral side of the trachea just above the isthmus of the gland where a branch of the nerve swings upward to enter the larynx. When the nerve is injured at this point it is generally the result of attempting to catch a vessel that has retracted along the side of the trachea. This vessel is more or less constant and should be clamped before it is cut, thus avoiding this accident. The superior laryngeal nerve occasionally is injured in ligating the superior pole. This can be avoided easily by carefully exposing the superior pole and by passing the hemostats from the mesial to the lateral side of the superior thyroid vessels, being careful to hold the internal jugular vein out of the way. In order to avoid hemorrhage, all patients are requested to cough or strain before the wound is closed as this will demonstrate any bleeding veins that might otherwise have been overlooked. If the surgeon is in the least uncertain as to the effectiveness of his hemostasis, he should ligate one or both of the inferior thyroid arteries proximal to its entrance into the gland.

The postoperative drainage will be reduced considerably and the formation of scar tissue will be minimized if the lobes are reconstructed by suturing the resected edges together. It is not always easy to reconstruct the isthmus but if this is done the sensory nerves in front of the trachea will be covered adequately with thyroid tissue and there will be considerably less postoperative cough and intratracheal mucus.

The question of drainage is always a controversial subject and several papers have appeared recently in the literature, both pro and con. The safest procedure is to leave a small penrose or rubber tissue drain in the wound and bring it out through the lateral end of the incision, thus avoiding the possibility of an unsightly scar that is sometimes seen when midline drainage is used. If this drain is removed in twenty-four hours it will not influence the ultimate cosmetic result and in the meantime fulfills an important place as a safety valve.

Of late, several surgeons have advocated exposure of the recurrent nerves and the parathyroids before even starting the resection of the gland. This is an unnecessary and time consuming procedure that will undoubtedly end in grief for in many cases more damage will be done in looking for these structures than in trying to avoid them.

After resection of the first lobe it is desirable to have the patient talk in order to be certain of the functional integrity of the recurrent laryngeal nerve for in case of nerve injury the surgeon must be certain not to injure the opposite nerve. A nerve injury on a patient that is considered a poor risk is a definite indication to postpone the resection of the other lobe until a later date.

The incidence of recurrence of hyperthyroidism



involves certainly not more than 5 per cent, and probably less than 3 per cent of all patients on whom a conservative resection of the gland has been done. In attempting to reduce this percentage of recurrence, some surgeons have advocated removing all but a vestige of gland on either side while others have advised removal of the entire gland with the avowed purpose of producing hypothyroidism. To my knowledge, there never has been any convincing data submitted to prove that the results of the radical procedure are superior to the more conservative operation and the risk of injury to the laryngeal nerves and parathyroids is certainly much higher in the radical operation. Since a high proportion of these patients are entirely relieved of their symptoms by subtotal thyroidectomy, there must be a readjustment of the remaining portion of the resected gland so that its function is regulated to meet the varying demands of the body.

Any assumption that the most frequent cause of recurrence is inadequate surgery must wholly disregard the fact that there may be a recurrence of the unknown stimulus which originally caused the disease. It cannot be denied, however, that there are certain predisposing etiological factors which do influence recurrence such as: first, emotional stresses which result from shock, worry, and intense living or overwork; second, focal infections and some of the infectious diseases and, third, the increased physiological activities of adolescence or pregnancy. Moreover, iodine deficiency or changes in the body metabolism also may be predisposing factors. In the prevention of recurrence, it is of prime importance that all of these factors be taken into consideration.

The remaining hazards which are encountered occur in the immediate postoperative period. Since respiratory infections rank among the highest, oxygen therapy should be given immediately after operation to all elderly persons and to all other patients in whom the risk is considered high. Since the symptoms of toxicity often occur rapidly after the withdrawal of iodine, it is important that the iodine be continued after operation. Sufficient amounts of sedatives are essential as these patients must be kept quiet and comfortable during the immediate postoperative period.

Fortunately, careful preoperative preparation has practically eliminated the incidence of severe postoperative explosive crises. Should one occur, the patient is kept as quiet as possible, is surrounded with ice bags and is given between three and four liters of 10 per cent dextrose solution intravenously every twenty-four hours together with large doses of iodine. Oxygen therapy and blood transfusions are especially useful.

In spite of the hazards that have been mentioned, thyroid surgery has been so perfected in the last two decades that the results are highly satisfactory.

## PNEUMOCOCCAL PNEUMONIA

OBSERVATIONS UPON THE INCIDENCE AND THERAPY  
IN ST. LOUIS AREA, 1939-1940

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It is well recognized that both type specific serum and sulfapyridine are effective therapeutic agents in the treatment of pneumococcal pneumonia. The present study embraces a continuation of previous studies of pneumonia in the St. Louis area. Special attention has been directed toward continued observation of the type incidence and the effects of various therapeutic agents, separately or in combination.

A total of 308 cases of pneumonia were seen in a group of St. Louis hospitals during the winter of 1939-1940. The patients were taken in order of admission and none was excluded upon whom a diagnosis of pneumonia was made. All diagnoses were confirmed by roentgen ray examination of the chest. No patients were accepted for the study who were under 10 years of age. There were 228 (74 per cent) white persons and eighty (26 per cent) Negroes.

The Quellung method of typing was used. Confirmation of the typing obtained from the sputum was not done unless there was doubt in the direct typing or unless several types of pneumococci were present. All sputa were cultured, either in mice or on artificial media, when no direct typing was obtained. On a few occasions the definite offending organism was obtained from the blood culture, in the absence of sputum typing, or in the presence of several types of pneumococci in the sputum. Lung suction was done frequently in an attempt to detect the organism responsible. In no instance did the organism recovered from the blood stream or lung puncture disagree with the results obtained from direct sputum typing. Forty-one lung suction were done on thirty-seven patients with successful results in twenty-five instances (61 per cent). In only one instance was there a complication which might have been attributed to the procedure. Following the second puncture this patient developed a hydropneumothorax; recovery was rapid and uneventful.

Despite all efforts, in thirty-six patients (11.7 per cent) with pneumonia, which was pneumococcal from the clinical point of view, no organisms could be obtained and typed. These cases have been included in the study and are in the sulfapyridine treated group. Most of these patients entered the hospital late in the course of the disease and some

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had received drugs prior to entering. There were no deaths in this group.

In comparing the incidence of the various types of pneumococci in the last two years, one finds a close correlation.

Table 1. Comparison of Type Incidence for Last Two Years

Order of Frequency	Type	1938-39 (349 Cases)		Type	1939-40 (308 Cases)	
		Number Cases	Per Cent Incidence		Number Cases	Per Cent Incidence
1st	I	71	20.3	I	63	20.4
2nd	III	38	10.8	III	47	15.3
3rd	V	30	8.5	VII	25	8.1
4th	VII	26	7.4	VIII	25	8.1
5th	VIII	24	6.8	II	23	7.4
6th	VI	21	6.0	V	18	5.8
7th	XIX	16	4.5	IV	12	3.9
8th	IV	15	4.2	XIV	5	1.6
9th	II	10	2.8	XX	5	1.6

Table I shows that types I, IV, V, VII and VIII have about the same frequency and relative position for 1938-1939 and 1939-1940. Type III infections were 5 per cent higher in the latter year. There was a notable drop in the frequency of types VI and XIX, the incidence of each being less than 1 per cent this year. These changes no doubt are explained by the fact that there were many children in the 1938-1939 series while there were none in the present group. It is recognized that types VI and XIX occur more frequently in children, whereas type III is less frequent in children. Not shown in the chart but significant is the fact that no pneumonia of type XXVII has been seen in the two years, and that there were four cases of type XXXIII infections identified in the present series.

In the 308 cases there were thirty-three deaths, giving a gross mortality rate of 10.7 per cent. In further analysis 11 of these thirty-three cases have been excluded. Nine were excluded because they died within twenty-four hours after hospitalization. Of the other two, one was admitted six weeks after the onset of the disease with empyema necessitatis

and cellulitis of the anterior thorax; the other, an 89 year old woman, died of coronary thrombosis while still in the hospital awaiting transfer to a nursing home after completely recovering from the pneumonia. Table 2 presents these cases in detail.

After excluding these eleven cases, there remain 297 patients with twenty-two deaths, giving a corrected mortality of 7.4 per cent. For discussion these 297 patients have been further divided into two groups depending upon the therapy received. A summary of these cases with type distribution, deaths and mortality rates is presented in table 3.

Table 3. Summary—Corrected Cases

Type	Serum-Sulfapyridine Treated		Sulfapyridine Treated		Total—All Cases		
	Number	Deaths	Number	Deaths	Number	Corrected	Mortality
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Per Cent
I	45	2	15*	0	60	2	3.3
II	16	2	5*	0	22**	2	9.0
III	3	0	43	7	46	7	15.2
IV			11	1	12**	1	8.3
V	10	2	7*	0	17	2	11.6
VI			3	1	3	1	33.3
VII	17	2	7*	0	24	2	8.3
VIII	20	2	3*	0	23	2	8.7
IX			3	0	3	0	0
X			2	0	2	0	0
XI			2	0	2	0	0
XII			3	0	3	0	0
XIII			1	0	1	0	0
XIV	4	0	1*	0	5	0	0
XV			2	1	2	1	50.0
XVI			1	0	1	0	0
XVII			2	0	2	0	0
XVIII			2	0	2	0	0
XIX			2	0	2	0	0
XX			5	1	5	1	20.0
XXI			3	0	3	0	0
XXII			1	0	1	0	0
XXIII			1	0	1	0	0
XXIV			1	0	1	0	0
XXV			1	0	1	0	0
XXVI			1	0	1	0	0
XXVII			3	0	3	0	0
XXVIII			3	0	3	0	0
XXIX			3	0	3	0	0
XXXIII			3	1	4**	1	25.0
Multiple Types			11	0	11	0	0
No Type			36	0	36	0	0
Total	116	10	178	12	297	22	7.4
	(8.62 Per Cent)		(6.74 Per Cent)				

\* The sum of the groups so marked comprise 37 cases of types for which serum was available but was not given.

\*\* Figures include one patient each who received no specific therapy.

Table 2. Deaths Excluded (11 Cases)

Type	Age	Sex	Day of Disease	Involvement	Bacteremia	Units of Serum Given	Grams Sulfapyridine	Died After Admission	S.S.S.
I	55	F	10	Right, left upper lobes	No	300,000	6	9 hrs.	Neg.
I	38	F	3	Right, lower lobe, postpartum hemorrhage	No	200,000	7	16 hrs.	Neg.
I	45	F	8	Left upper, lower lobes	No	100,000	6	8 hrs.	Neg.
II	43	M	42	Right upper lobe, empyema	No	200,000	18	48 hrs.	Neg.
III	46	M	14	Right lower lobe	Yes		2	8 hrs.	Neg.
V	83	F	5	Right upper, middle, lower lobes	Yes	200,000	7 sod. sul.	13 hrs.	Neg.
VII	65	M	5	Right middle, lower lobes	Yes	No treatment		3 hrs.	Not done
VIII	41	M	2	Right lower lobe*	No	60,000		6 hrs.	Neg.
VIII	66	M		Right upper lobe	Yes		1	3 hrs.	Not done
X	89	F		Right upper lobe	No		Yes	3 wks. of coronary thrombosis after recovery	Not done
XIX	43	F	4	Right lower lobe**	No		9	20 hrs.	Not done
							3 cc. antigen		

\* Nodular goiter, hyperthyroidism, auricular fibrillation, congestive heart failure.

\*\* Mitral stenosis, cirrhosis of liver, ascites.



## SERUM—SULFAPYRIDINE TREATED CASES

There were 122 patients who received a combination of type specific serum and sulfapyridine therapy. Of these, six cases were excluded (as noted in table 2 in the group of eleven cases) leaving a total of 116 cases. Type specific serum was available for only types I, II, V, VII, VIII and XIV, and all the cases in this group are of these types with the exception of three patients with type III infections who were able to obtain their own serum.

In the group of 116 patients there were ten deaths giving a mortality rate of 8.62 per cent. It is significant in discussing this group that there were thirty-seven other cases for which serum was available (noted in table 3) who were treated with sulfapyridine alone. These cases did not receive serum because they were not ill enough to justify its use or they had already responded to sulfapyridine before the type was determined. There were no deaths in this group. All patients for whom serum was available were so treated if their clinical condition demanded it.

The upper left hand corner of table 3 shows this series analyzed as to type incidence, deaths, type mortality and total mortality. There were no deaths in the types III and XIV group. There were two deaths each in types I, II, V, VII and VIII.

Experimental evidence has shown that in rats<sup>1</sup> approximately one fifth each of the dosage of sulfapyridine and type specific serum when used in combination is equivalent to five fifths of either agent used alone in protective power against pneumococci. On the basis of this work and other evidence suggesting that sulfapyridine is more effective in the presence of antibody, a group of patients was treated with reduced amounts of the two agents used simultaneously. These patients were selected in that all were treated within ninety-six hours of onset and all had only one lobe involved. They were empirically given from 40,000 to 60,000 units of type specific serum and started on 0.5 gm. of sulfapyridine every four hours. If at the end of twenty-four hours the temperature was not below 37.7 C. they were given further serum and the dosage of sulfapyridine was raised.

Table 4. Serum—Sulfapyridine Treated Cases Within 96 Hours of Onset, 1 Lobe Involved. All Cases Recovered

Type	Number Cases Received 40,000 60,000 Uts	Cases Requiring Further Serum	Per Cent Cases Requiring Further Serum	Total Average Units In Patients Requiring Further Serum
I	30	10	33.3	85,000
II	8	1	12.5	80,000
V	3	0		
VII	7	1	14.2	80,000
VIII	16	0		
XIV	3	0		
Total	67	12	18.0	84,000

As shown in table 4 there were sixty-seven patients treated in this manner with no deaths. Of

1. Powell, H. M., and Jamieson, W. A.: Combined Immuno and Chemotherapy of Pneumococcus Rat Infections. Proc. Soc. Exper. Biol. & Med. 41:281 (May) 1939.

the sixty-seven cases only twelve, or 18 per cent, required further serum. The largest percentage of cases requiring further serum was seen in type I infections, 33.3 per cent. It is interesting that even in cases requiring more serum the total serum administered averaged only 84,000 units per patient. Although there was a relatively high number of type VIII cases in this group (sixteen) none received additional serum. The impressive point from the clinical aspect was the relative freedom of these cases from the usual severe nausea and vomiting seen when sulfapyridine is given in larger doses. Blood sulfapyridine levels ranged from a trace to 7.5 mg. per cent but the usual level was from 1.5 to 3.0 mgs. per cent. There were four cases of bacteremia in this series (two type I, one type VII and one type XIV) and two of them required further serum (two type I) after the initial 40,000 units.

The remaining forty-nine cases in the group of 116 receiving a combination of serum and sulfapyridine were given full doses of sulfapyridine and amounts of serum depending upon the clinical indications.

Table 5. Pneumonia Cases Treated With Type-Specific Rabbit Serum and Sulfapyridine. Amount of Serum Administered—Number of Doses

Type	Average Amounts—Units	Limits—Units	Average Number Doses	Limits Doses
I	105,000	40,000- 400,000	1.37	1-3
II	109,000	40,000- 400,000	1.41	1-3
III	100,000	100,000	1.00	1
V	232,000	40,000-1,100,000	1.90	1-7
VII	116,000	40,000- 300,000	1.41	1-2
VIII	157,000	40,000- 800,000	1.38	1-5
XIV	188,000	40,000- 700,000	2.66	1-5

Table 5 shows a composite graph of all patients receiving serum. The amount of serum, limits of total dosage and the limits and averages of number of doses are shown. All these patients also received sulfapyridine. As can be seen, the average amount of serum per patient is quite high, especially in types V, VIII and XIV. This high average was in each instance due to a few critically ill patients who received tremendous doses.

## REACTION TO SERUM

The incidence of immediate reactions to the intravenous administration of 176 doses of rabbit serum to 122 cases was only 12.4 per cent. This is shown in table 6. This figure is much lower than that seen in our previous experience, which checked favorably with that of other workers, and suggests that the small dose of serum used in many of the patients may have been responsible.

A total of twenty-two reactions occurred in 176 administrations of serum (12.4 per cent). There was no indication that the two reactions which occurred in patients who subsequently died contributed to the death.

Of the 106 patients receiving serum who survived, only seventeen cases showed serum sickness, giving

Table 6. Incidence of Immediate Reactions to Intravenous Rabbit Serum  
Analysis of All Serum-Treated Cases

Type	Number Cases	Number Doses	Immediate Reactions:			Number Cases Recovered	Analysis of Reactions and Deaths	
			Febrile	Shock	Urticaria		Number Cases Died	Reactions
I	48	68	4	0	1	43	5	None
II	17	24	1	0	0	14	3	1 chill (2 subsequent doses with no reactions)
III	3	3	1	0	0	3		
V	11	21	2	2	1	8	3	1 shock, recovered; died 6 wks. later with meningitis and endocarditis
VII	17	24	0	0	0	15	2	None
VIII	21	28	5	0	0	18	3	None
XIV	5	8	3	0	0	5		None
Totals	122	176	16	2	2	106	16	2 (1 chill) (1 shock)

Table 7. 106 Cases Treated With Serum and Sulfapyridine—All Recovered. Incidence of Serum Sickness

Type	Total Number of Cases	Mild	Reactions Moderate	Severe
I	43	1	4	1
II	14	2	2	1
III	3	0	0	0
V	8	0	1	2
VII	15	2	0	0
VIII	18	0	0	1
XIV	5	0	0	0
Totals	106	5	7	5

Total of 17 cases serum sickness—incidence 16 per cent.

an incidence of 16 per cent. Eleven of these 106 cases received prophylactic histaminase orally (five tablets were given every four hours for four doses the day following the administration of serum and ten tablets a day were given thereafter for four more days). One had mild serum sickness. In addition to the eleven patients mentioned, there was another who received prophylactic histaminase among those who died. This patient had severe serum sickness but died of a thyroid crisis on the twelfth day. Thus in ninety-five patients not given histaminase there were sixteen instances of serum sickness (16.8 per cent). In twelve patients given histaminase\* there were two instances of serum sickness (16.6 per cent). This latter group is small but fails to suggest any protection against serum sickness by the prophylactic use of histaminase.

#### SULFAPYRIDINE TREATED GROUP

This group is composed of patients treated with sulfapyridine and pneumococcus antigen or with sulfapyridine alone. From the clinical point of view the two groups were so nearly identical that they have been considered together for discussion. (See table 3.)

The antigen used was a killed suspension of pneumococci.\*\* No other organisms were present in the vaccine. It was administered subcutaneously in 1 cc. doses at from six to twelve hour intervals. A total of 8 cc. was given within the first four days of hospitalization. The administration of the vaccine was not on any occasion accompanied by recog-

nizable constitutional reactions. There was redness, increased heat, induration and tenderness about the site of most injections.

Sulfapyridine was administered largely by mouth. The scheme of dosage followed was 1 gm. every hour for four hours, then 1 gm. every four hours until the temperature was normal for twenty-four hours, at which time it was changed to 1 gm. every six hours and continued for four days. Generally speaking, the blood level was used as the criterion for further changes in dosage after this plan of dosage had been instituted. It should be mentioned, however, that the clinical course of the disease did not necessarily bear a close relation to the blood concentration; many cases responded with levels below 5 mgs. per cent and consequently the dosage was not altered. Blood levels of from 5 to 10 mgs. per cent were considered satisfactory but the optimum level was placed at from 7.5 to 8 mgs. per cent. Sodium sulfapyridine was used to attain a satisfactory blood level when such could not be reached by oral administration, when the patient's condition demanded an immediate high level or when it was not possible to give the drug by mouth. The sodium salt was given as a 5 per cent solution in distilled water. The dosage varied considerably but generally it was found that 0.1 gm. per kilo of body weight as an initial dose followed by 0.05 gm. per kilo every twelve hours would keep the blood level at about 10 mgs. per cent. When combined with oral administration, correspondingly smaller amounts were necessary by vein. Many of the patients receiving the drug intravenously complained of a sense of increased heat over the body during the period of administration but no immediate reactions of any type were seen. Early in the course of the study both sulfapyridine and sodium sulfapyridine were given by rectum to a few cases. It was soon found that with this method of administration the resulting blood levels were entirely unpredictable and consequently it was abandoned.

Of the 308 cases, 182 were in the sulfapyridine treated group. There were fifteen deaths giving a mortality rate of 8.24 per cent. In arriving at a corrected mortality rate four cases were excluded (table 2), leaving 178 cases with twelve deaths (6.74 per cent). These cases were distributed over all of the types represented in the series. Type III was most prevalent with forty-three cases; types I,

\* Histaminase supplied by the Winthrop Chemical Company.

\*\* Vaccine supplied by the Eli Lilly Co.

Each cc. of vaccine contained: 4 billion pneumococci type I, 4 billion pneumococci type II, 1 billion pneumococci type III, 2 billion pneumococci type IV, 2 billion pneumococci type V, 1 billion pneumococci type VII, 1 billion pneumococci type VIII, 1 billion pneumococci type XIV, 4 billion pneumococci DRI.



IV, V, VII, II and XX, respectively, were next in frequency. There were thirty-seven cases in this group who received sulfapyridine alone for whom serum was available as mentioned previously.

There were thirty-six cases included in the group which were apparently pneumococcal pneumonia but no typing could be obtained from the sputum and there was no growth on culture of the blood. There were no deaths in this group of untyped cases.

Eleven cases in this series had multiple types of pneumococci in the sputum. There were nine others with two or more types in the sputum but they were later classified definitely as to type on the basis of organisms obtained from the blood or upon lung puncture. No deaths occurred in this group of multiple type infections.

#### TOXIC MANIFESTATIONS OF SULFAPYRIDINE

Serious toxic manifestations of sulfapyridine were rare. Nausea and vomiting were usual in the cases receiving large doses of the drug. There were frequent complaints of headaches, usually frontal, and occasional complaints of blurring of the vision and diplopia. None of these was considered serious enough for the drug to be discontinued. Cyanosis was seen not infrequently but on no occasion did it seem of enough consequence to merit administration of methylene blue.

Skin rashes were present in six cases of which three were maculo-papular and three were scarlatinaform in type. In one instance there was a maculo-papular eruption but the patient's condition was such that we did not feel justified in discontinuing the drug. Despite the continued administration of sulfapyridine under careful observation, the rash disappeared within seventy-two hours. In another patient with a type III bacteremia the skin lesions appeared during administration of the drug, disappeared within twenty-four hours after stopping it and reappeared subsequently following the administration of both sulfanilamide and sulfathiazol.

"Drug fever" was present definitely in three cases but promptly subsided after cessation of the sulfapyridine.

Mental disturbances were seen in four patients more than 50 years old. One manifested as delirium and disorientation while three showed severe lethargy and somnolence. In one woman, 61 years of age, the somnolence became so marked that food or fluids could no longer be given by mouth. Within twenty-four hours after withdrawal of the sulfapyridine and the administration of parenteral fluids, she was awake, alert and able to take a full diet.

Evidence of toxic action by sulfapyridine upon the hemopoietic system was seen only once. One case of neutropenia was seen when the white blood count dropped in five days from an admission total leukocyte count of 16,000 to 2,200. There, however, was still a preponderance of cells of the granulocytic series in the differential smear. The drug was discontinued and there was a progressive rise in

the total white cell count, in four days reaching 7,200. Seven patients with total white cell counts of less than 6,000, of which two were less than 5,000 and two less than 4,000 on admission, were given sulfapyridine. Following the institution of therapy, the counts in each instance rose to higher levels, in one case to 11,000. No cases of hemolytic anemia were seen.

There was one case of gross hematuria which subsided promptly after the sulfapyridine was discontinued. Other cases of microscopic hematuria may have occurred unrecognized as it was not possible under the existing conditions to do daily microscopic urine analyses. In one patient dying of type III pneumonia who had received sulfapyridine orally and sodium sulfapyridine intravenously, autopsy revealed almost complete blockage of both ureters by crystals which on qualitative analysis gave a strongly positive reaction for sulfapyridine. The ureters and kidney pelvis, however, did not show any appreciable dilatation and there had been no oliguria prior to death.

#### COMPLICATIONS

The incidence of complications was quite low in the series. One very impressive fact is that there were no empyemas encountered in the total of 275 patients who recovered. One patient had an empyema necessitatis on admission and died (type II). Another patient with a type VII bacteremia was admitted fourteen days after the onset and died on the twenty-first hospital day despite serum and sulfapyridine therapy. Autopsy revealed an interlobar empyema on the right and pneumonia of both lower lobes. There were, however, eight cases of serous pleural effusion proved by aspiration. They were encountered three times in type I infections and once each in types II, III, V, VIII and in one case in which no type was obtained.

There were four cases of lung abscess; two type III cases had a single cavity and one type VI case had multiple cavities on admission. All recovered. Multiple abscesses were found in another type III case at autopsy.

In five cases resolution by physical and roentgen ray evidence was delayed beyond thirty days after onset of the disease. There were two each in type III and type VII infections and one in which no type was determined. All of these patients recovered.

Spontaneous pneumothorax occurred in one patient with types XX, XXIV and XXIX pneumococci in the sputum; no lung puncture had been attempted in this case. He complained of progressively increasing dyspnea for several months prior to the onset of his pneumonia and since recovery large emphysematous bullae are evident on radiographs of the chest. The pneumothorax was probably a result of increased demands upon the non-pneumonic lung by virtue of the pneumonia and resulting in rupture of one of these bullae. This seems especially likely as the pneumothorax was localized and was in the lower left chest whereas

Table 9. Cases Without Significant Complicating Illnesses (8 Cases)

Type	Age	Sex	Day of Disease	Involvement	Bacteremia	Grams Sulfapyridine	Grams Sodium Sulfapyridine	Died After Admission	S.S.S.
III	55	F	3	Right upper, lower lobes; left lower lobe	Yes	7	12	5 days	Neg.
III	70	M	7	Right upper, lower; left upper lobe	Yes	13.5	30	6 days	Neg.
III	71	M	3	Left lower lobe	No	6		38 hrs.	Neg.
IV	66	F	10	Right, left lower lobes	Yes	16		5 days	Neg.
VII	57	M	14	Right, left lower lobes	No	55	140,000 units serum	21 days empyema, unresolved pneumonia	Neg.
VIII	55	M	4	Right lower lobe	Yes	12	800,000 units serum	36 hrs.	Neg.
XX	39	M	6	Left upper, lower lobes	No	7		30 hrs.	Not done
XXXIII	72	M	?		No	38	20	12 days	Not done

the left upper lobe only was involved by the pneumonia.

Hydrarthrosis of the right knee was seen during the course of a type XX pneumonia. Blood cultures showed no growth and the patient recovered completely after aspiration of 80 cc. of straw colored fluid. The fluid was sterile on culture and showed 12.8 mgs. per cent of sulfapyridine. This sulfapyridine level may have been partially or totally a false value, however, for 2 per cent novocain had been used as the local anesthetic during the procedure and it is known that novocain also gives the color reaction similarly to sulfapyridine in the chemical determination of sulfapyridine.

#### ANALYSIS OF DEATHS

Analysis of the thirty-three deaths occurring in this series reveals some interesting facts. After ex-

Table 8. Analysis of Deaths Included in Series (22 Cases). Cases Having Significant Complicating Illnesses (14 Cases)

- 1 Rheumatic mitral stenosis (type VIII, age 26).
- 1 Active rheumatic pancarditis (type I, age 14).
- 2 Arteriosclerotic heart disease.
  - 1 Auricular flutter, congestive failure (type III, age 75).
  - 1 Congestive failure (type III, age 71).
- 2 Syphilitic heart disease with aortic insufficiency, no failure (type V, age 50), (type II, age 52).
- 1 Taboparesis with general debilitation (type III, age 75).
- 1 Adenomatous goiter with hyperthyroidism, thyroid crisis (type VII, age 38).
- 1 Severe bronchial asthma (type II, age 70).
- 1 Severe bronchiectasis and pulmonary emphysema (type I, age 66).
- 1 Lung abscess ? (type III, age 58).
- 2 Pulmonary tuberculosis, active (type VI, age 31), (type V, age 55).
- 1 Chronic ulcerative colitis, recent ileostomy, remote cecostomy (type XV, age 25).

cluding the eleven deaths listed in table 2, there remain twenty-two. Further study of these twenty-two cases shows that fourteen had significant complicating illnesses with the pneumonia.

It will be noted in table 8 that six of the fourteen cases had significant cardiovascular disease and that five had important primary pulmonary disease in addition to the pneumonia. The other three deaths were complicated by taboparesis in a 75 year old male, hyperthyroidism and severe chronic ulcerative colitis. It is significant that preexisting cardiorespiratory disease greatly increases the mortality rate in pneumonia.

There were eight deaths in patients who, theoretically, were in the hospital long enough to have received adequate therapy and had had no significant complicating illnesses (table 9).

Further analysis of deaths reveals that fifteen, 45.4 per cent, of the thirty-three cases having bacteremia died. The bacteremias were divided among eight types. Bacteremias were more frequent, actually and per case, in type I pneumonia than in

Table 10. Relation of Bacteremias to Death

Type	Total Number Cases	Number of Bacteremias	Number of Deaths	Percentage Mortality
I	63	9	1	11.1
II	23	2	1	50.0
III	47	6	4	66.7
IV	12	2	1	50.0
V	18	5	3	60.0
VII	25	5	3	60.0
VIII	25	3	2	66.7
XIV	5	1	0	0
Total	218	33	15	45.4

Groups of cases in types not listed contained no bacteremia.

Table 11. Relation of Age to Deaths

Decade	Number of Cases	Number Deaths	Types	Per Cent Mortality
151 Cases (49.1 Per Cent)	35	1	I	2.8
	43	1	VIII	2.3
	73	5	I, VI, VII, XV, XX	6.8
157 Cases (50.9 Per Cent)	49	5	I, II, III, VIII, XIV	10.2
	48	8	I, II, 2-III, 2-V, VII, VIII	16.7
	36	4	I, IV, VII, VIII	11.1
	20	7	II, 5 III, XXXIII	35.0
	4	2	V, X	50.0
Total	308	33		10.7



Table 12. *Analysis of Deaths. Relation of Duration of Disease on Admission to Deaths*

Type	Admitted Within 96 Hours			Admitted After 96 Hours		
	Cases	Deaths	Per Cent Mortality	Cases	Deaths	Per Cent Mortality
I	36	2	5.5	27	3	11.1
II	12	1	8.3	11	2	18.2
III	26	2	7.7	20	6	30.0
IV	3	0	0	9	1	11.1
V	6	0	0	12	3	25.0
VII	14	0	0	11	3	27.4
VIII	16	2	12.5	9	2	22.2
XIV	4	0	0	1	0	0
Others	49	2	4.0	42	4	9.5
Totals	166	9	5.4	142	24	16.9

any other type but the mortality percentage in these bacteremias was much lower than for any other type. Table 10 shows these figures.

Table 11 shows the relation of all deaths in the series to age by decades. The highest mortality is in the ninth decade where two of four, or 50 per cent died. It is also noted that although the number of cases below and above 40 years of age is approximately the same, that 79 per cent of the deaths occurred in that half above 40. The increasing prominence of type III infections with the advance in age is also significant. The average age for all deaths was 55 years.

When the deaths are examined in relation to the duration of disease upon admission to the hospital, it is noted that only 5.4 per cent of those admitted within the first ninety-six hours died, whereas the mortality is over three times as great or 16.9 per cent in those admitted after ninety-six hours. Table 12 shows these facts with further analysis as to types.

#### DISCUSSION

Although the cases in this series have been divided into two groups depending on the therapy received, the two groups are not comparable. Only three of the forty-seven type III cases received serum. The sulfapyridine treated group contained thirty-seven cases of types I, II, V, VII and VIII who were not given serum because their condition did not demand it. The serum-sulfapyridine treated group contains none of the higher types of pneumococcal pneumonias.

Serum and sulfapyridine can be used in conjunction successfully in the larger percentage of early pneumonias but in smaller dosages than usually recommended, thus contributing to the greater comfort of the patient than if treated with sulfapyridine alone and more economically than if treated with type specific serum alone. It has not been proven that the results will be any better with the combination than with either agent alone; this must await the answer of further clinical evidence.

Any role played by antigen when given in combination with sulfapyridine cannot be evaluated clinically. A report of the possible effect of the antigen upon immune processes has been made elsewhere.

One is impressed by the lack of empyemas in the series. Despite the fact that there were several

serous effusions, none resulted in empyema. It is our belief that some of these serous effusions would have terminated as empyemas had it not been for the sulfapyridine present in the fluid.

Advanced age and duration of the disease at the time therapy is instituted are most important factors in determining the outcome of the disease. The mortality rate rises with each decade after 40 and in the ninth decade was 50 per cent in our series.

Only one third as many patients admitted within 96 hours of the onset died as those admitted later in the disease.

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## CLINICAL GASTROSCOPY

WITH FINDINGS IN 356 EXAMINATIONS

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AND

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Gastroscopy, the endoscopic study of the gastric mucosa, is a recently introduced diagnostic method, now routinely employed in several medical centers but still unknown or unappreciated by the majority of physicians outside such institutions. The purpose of this report is to describe briefly the advantages of this procedure and to present findings in 356 examinations.

Historically, gastroscopy is among the earliest of endoscopic procedures, dating to 1868 when Kussmaul attempted to view the interior of the stomach of a sword swallower through a rigid metal tube but failed because of insufficient illumination. Nitze, who introduced the cystoscope, likewise tried intragastric visualization but was unsuccessful for the same reason. The famous surgeon Mikulicz was much interested in the possibilities of such a method and designed a rigid, angulated gastroscope by which he hoped to avoid the danger of esophageal perforation at the cardia. Later, he gave up gastroscopy, probably because of the unfortunate fatalities which are bound to attend the frequent or routine examination with a rigid instrument.

As a result, gastric endoscopy remained impractical until 1932 when Dr. Rudolf Schindler introduced a flexible gastroscope. This unique endoscope, being readily flexible, removed the risk of perforation and still permitted complete visualization when bent to as much as a 34 degree angle. Figure 1 is a drawing of the Wolf-Schindler gastroscope. The lower, flexible half contains more than forty pairs of lenses, the upper rigid portion encases fewer, similar ones. These transmit an upright real image from the distal objective lying adjacent to a brightly illuminated electric bulb to

From the Gastrointestinal Clinic of the Washington University Dispensary.

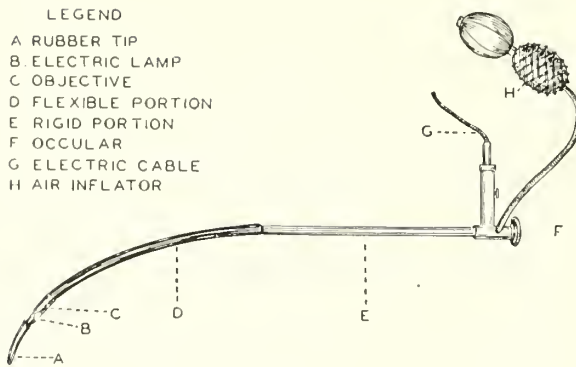


Fig. 1.

the ocular at the proximal end. An air channel within the tubing with vents near the objective permits distention of the stomach necessary for a satisfactory view.

Introduction of the gastroscope is relatively simple and safe when the routine outlined by Schindler is followed. The throat is anesthetized with 2 per cent pontocaine which obviates gagging and allows introduction of the instrument in about thirty seconds. Ordinary cleanliness is observed but surgical asepsis is unnecessary. No disability results; the great majority of patients are examined outside the hospital and are able to leave the physician's office in from fifteen to thirty minutes after the examination. They usually experience moderate irritation and discomfort in the pharynx for from two to four hours following gastroscopy but have no other distress.

Contraindications to gastroscopy are primarily those disorders which produce esophageal constriction such as carcinoma, mediastinal tumor, aneurysm, achalasia and benign stricture. Cardiac decompensation, uremia and mental deterioration are constitutional conditions which make examination inadvisable.

Indications for gastroscopy include all disorders that affect the stomach, either primarily or secondarily. In no sense should it be inferred that the procedure is intended to displace or supercede gastrointestinal roentgenology; rather, it is a valuable supplementary method of diagnosis. If one should have to choose between training in either specialty, then certainly roentgenology should be mastered first. It seems a justifiable prediction, however, that in the future gastroscopy will be just as vital to the gastroenterologist as cystoscopy is to the urologist.

Such prophecy has sound basis in the fact that, if this examination served no other purpose, it is the only method of diagnosing chronic gastritis. Templeton has made most meticulous mucosal relief studies in cases of gastritis diagnosed by Schindler and concludes that the roentgenological method is not reliable in recognition of this disease. Furthermore, the frequency of this disease is rapidly becoming evident as statistics of others and our own figures indicate.

The differentiation of benign and malignant gastric ulcers is another problem the solution of which is frequently facilitated by gastroscopy. Large late lesions cause the roentgenologist little difficulty but the distinction with small niches is often questioned. An experienced gastroscopist usually can make a definite diagnosis in the early stages of carcinomatous ulceration. In patients with doubtful benignancy, endoscopy may lend support to a therapeutic test by medical measures.

The recognition of marginal (gastro-jejunal) ulcers at a gastroenterostomy stoma often is expedited by gastroscopy. Other changes in the stomach mucosa following gastric surgery—these may be of the most severe forms of gastritis—are visualized readily. Rare lesions such as benign tumors, Hodgkin's disease and gunmata also may be studied.

In the last year we have had the opportunity of completing 356 examinations on 321 patients. Table 1 is a tabulation of these patients. The ma-

Table 1. Tabulation of Patients

Total number of examinations	356
Number of patients	321
Repeated examinations	35

jority of the eight unsuccessful attempts were due to anatomical deformities such as temporomandibular ankylosis. The first thirty or forty examinations are not included in the statistics, since these were necessary to master the technic and visual orientation. The series was begun only after particular training and study in this specialty was completed.

Table 2 records the incidence of various types of lesions observed by us and the incidence reported

Table 2. Incidence of Lesions

	Authors' Findings		Schindler's Findings in 1,000 Cases	
	No. of Cases	Per Cent	No. of Cases	Per Cent
Normal stomach	144	44.8	222	22.2
Gastric purpura + hemorrhagic erosions	6+6	3.6	56	5.6
Gastric ulcer	12	3.7	71	7.1
Chronic gastritis	131	43.0	418	41.8
A. Atrophic	78	25.0	136	13.6
B. Hypertrophic	9	4.0	170	17.0
C. Superficial	44	14.0	110	11.0
Gastric cancer	13	4.0	77	7.7
Benign tumors	5	1.5	22	2.2
Syphilis	2	0.6	3	0.3
Pyloric stenosis	2	0.6		
Failures	6	1.8	14	1.4
Wrong diagnosis	2	0.6		
Accidents	1	0.3	3	0.3
Gastro-enterostomies	4	1.2	80	8.0

by Schindler. While there are a few divergences in these data, the close similarity in general is striking. The total percentage of chronic gastritis in the St. Louis group is practically the same as Schindler's, yet there is considerable difference in the various types. This probably is explained by two facts: first, the Chicago studies include a larger percentage of postoperative cases and, second, they



also include a larger percentage of hospital cases than the St. Louis series. The other marked variation in the percentage of normal cases is due to the fact that the authors' group comprises a greater number of patients from the outpatient department who present themselves because of purely functional symptoms.

No attempt is made in this report to correlate the gastroscopic findings with symptomatology or with concomitant diseases.

#### SUMMARY

Gastroscope carried out with a flexible gastroscope is a safe endoscopic procedure. It is the only accurate means of diagnosing the various types of gastritis. In addition, it is often of value in distinguishing between benign and malignant gastric ulceration. Findings in 356 examinations parallel rather strikingly Schindler's findings in 1,000 examinations. The probable reasons for divergencies in these data have been considered.

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#### BIBLIOGRAPHY

1. Schindler, R.: *Gastroscope: The Endoscopic Study of Gastric Pathology*, Chicago; University of Chicago Press, 1937.
2. Schindler, R., and Templeton, F.: *Radiology* 29:472, 1937.
3. Ortmayer, M.: *Illinois M. J.* 71:482, 1937.
4. Schindler, R.: *The Incidence of the Various Types of Gastric Disease as Revealed by Gastroscopic Study*, *Am. J. M. Sc.* 197:509, 1939.

## THE MEDICAL CARE OF THE OLD AGED PATIENT

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The growing problem of caring for patients of middle age, from 40 to 60 years, and the ones past 60 years is important because the age limit of life has been extended. From statistics, one knows as age increases the percentage of persons who are not self supporting increases. At the age of 75 only 5 per cent are not entirely or in part dependent upon relatives or government aid for support. This has been emphasized by enactment of social security laws including old age pensions. Public health officers and state and county officials are confronted with the problem of seeing that such people are properly housed and properly cared for.

The worry of being destitute and not wanted contributes largely toward causing dysfunction of otherwise normal individuals. Even in competent individuals past middle age the fear of becoming dependent is at times a factor to be considered. Fear is akin to pain; therefore, who can say how much actual suffering such patients may have if there is a fear complex. In other cases, the disturbance caused by wrangling among relatives for the effects of the aged, prior to his death, may so depress or cause indignation as to cause him to make a bizarre will or marry in order to cut off effectually certain beneficiaries, or the worry may result in serious mental debility.

The subject, medical care of the aged, is broad. Such subdivisions as supervision of the nutrition of the aged, skin diseases incident to old age and mental changes associated with old age could be discussed as individual subjects. I am using the broad view that I may outline some of the highlights of this subject in which I have been particularly interested for several years.

About thirty-five years ago when orthopedics was young as a specialty and the general surgeon was contending there was nothing the orthopedist could do that a general surgeon could not do, it was my good fortune to hear an address by a prominent orthopedist. The basis of his theme was that the general surgeon had not developed an orthopedic mind. He elaborated on his meaning of the term orthopedic mind and the essential necessity of acquiring such for the successful practice of his specialty. The general surgeon's work is largely acute surgery. He operates, the patient is in the hospital a few days and the result of the surgery is soon established. An orthopedist's work frequently requires, after the surgery, many months of adjustment of appliances and observing progress, content if that progress be toward recovery. His mind has become trained not to become impatient.

Old age is not curable. It is a normal physiological process. There are changes in the structure of the body and the functioning of these structures are changed as an incident of age. These changes are normal in the evolution of age. When some pathological process becomes engrafted upon the normal process, the physician giving special attention to old age has an advantage in trying to make living more tolerable. He has learned patience, knowing he is fighting a losing fight. He is content to put a patch here, brace up a bit there, trying to restore the body to a normal state for that patient's age. Someone has said, "Nature in her wisdom provides for the changes in the body by returning the needs of the body to those of an infant."

Pediatrics was established largely through the need of special study of feeding problems in infants. The aged patient is prone to overindulge in foods his failing digestive system should not be asked to prepare for assimilation. Particularly is this true since dentistry can provide him with means to masticate the heartier types of food. Vitamin deficiency and endocrine imbalance recently have been stressed as important factors in the nutrition problem in the aged. There is a feeding problem for the aged as well as for the infant and the physician taking care of the aged should know how to determine his needs and outline a proper diet regime.

The clinical picture of acute diseases in the aged is different from that of earlier life. Each symptom must be traced to its source, differentiating between pathological symptoms and symptoms due to incidents of age; only in such way may symptoms be evaluated. The average elderly person is prone to minimize or defer medical care, therefore,

a pathological process is apt to be well advanced before medical care is sought. Acute processes are frequently mild in the beginning. Often pneumonia will not be recognized until there is marked consolidation. In chronic conditions, due to the changing mechanism controlling functions, the methods of procedure for restoring normal functioning must be different than those used in adolescence and the active years of life. Endocrine imbalance in middle life may induce the changes associated with old age, therefore, middle age as well as old age should be included in this field of study.

It is my firm belief that many cases of self destruction in old people are due to confinement in an institution when the individual is not a menace to the public or, having had care and management of property for which they have worked many years, this care is taken from them by relatives through court action. In many cases old people are eccentric and have mannerisms not pleasing to relatives; however, they are not a menace to the community and are not incapable of managing property. In their despair, and probable development of a fear complex, they see no way out except self destruction.

If it is true that every disorder of the mind, with the exception of those due to infectious disease and injury to the brain, can be traced to the first six or eight years of life, it is necessary, when making a study of a patient with senile mental change, to try and reconstruct the early life of the patient, thereby getting a picture of the influences creating impressions upon the young mind. The basic elements of our emotional life are inherited as a weak or strong will, bad or good temper, intuitive or reasoning mind. The primitive or basic elements may be improved, retarded or modified as the person develops in years. These basic elements should be balanced by the psychic changes due to environment to get a proper survey.

As one grows older there is a normal arteriosclerotic change in the blood vessels of the brain resulting in less vigor of the brain cells. The habits of thought become more fixed; there is not the adaptability or ability to readily create new ideas; the mind is more inclined to retrospection and living over the apparently heretofore forgotten earlier years of life. The arteriosclerotic changes in the brain may be gradual in onset and mild in action upon brain tissues causing such symptoms as forgetfulness, hypochondriacal ideas or melancholia, the latter, in particular, if there has been a previous period of self pity. There may be a paranoid trend such as having a fixed idea of persecution. In some the arteriosclerotic changes in the brain are progressive to a degree causing atrophy resulting in blindness or deafness, and in some cases causing complete destruction of brain tissue. The patient with mild arteriosclerotic change in the brain may be entirely normal insofar as social life is concerned.

I have stressed these features of mental change

because it has been my observation that frequently it is because of mannerisms or changing personality that care of the old person is first considered and, in fairness to the patient, the physician should be capable of guiding the relatives into a better understanding of the whimsical old patient, thereby, frequently avoiding disastrous consequences.

#### SUMMARY

I have endeavored to show that a physician giving special care to ills peculiar to middle life and old age must be well trained in general medicine, have given more than ordinary time to the study of nutrition, endocrinology and neuropsychiatry, have developed an ability to evaluate symptoms and trace such symptoms to their origins, and have developed patience.

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#### DISCUSSION

DR. WILLIAM J. SULLIVAN, Kirksville: I would like to stress the point that 95 per cent of the individuals who reach the age of 75 are dependent on relatives or some form of government relief not because they have not acquired during their income producing years enough to have saved an adequate amount to care for themselves in their old age but because they did not establish a definite program of setting aside a certain amount for their independence in old age. Because it is human nature to neglect this part of a life program, the government has made an effort to control such a savings through the Social Security Act so that eventually the old age assistance will be based upon his income during his productive years.

The proper housing of aged individuals is a definite problem confronting the profession, and public health officials particularly. Since the payment of old age pensions, there have sprung up in various parts of Missouri convalescent and old age homes which are inhuman in their treatment of the individuals and disgraces to the communities in which they are allowed to exist. Outside of metropolitan areas there are no regulations which force the operators of these homes to give the pensioners value for their money. In a few instances the convalescent homes are operating under satisfactory conditions.

Fear in the aged individual is one of the chief causes of his dependence upon others for support. It is also responsible for the failure of certain individuals to live out a full span of life. This is borne out by life insurance statistics which show that individuals who have annuities sufficient for their needs outlive most other individuals of the same age group.

I believe that if mental hygiene received more attention in the school and preschool ages, there would be less mental symptoms in the aged individuals in the future.

The aged individual has a tendency not to live his chronological age. Physicians can readily understand why an individual between 60 and 75 who is as active in social and business life as he was at the age of 45 has many vague complaints and definite symptoms that would probably disappear were he to confine his activities to pursuits normal to his age.

In addition to availability to the general practitioner or specialists in other fields, more physicians are needed who are willing to spend a great deal of time and effort in familiarizing themselves with the difference in the physiological and pathological processes taking place in the aged and who may assist the general practitioner when need arises.



## SULFANILAMIDE IMPLANTATION AS A METHOD OF CONTROLLING INFECTION IN CLEAN SURGICAL WOUNDS

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It has been stated that one of the parents of modern surgery is asepsis, and that surgical progress to a great extent is retarded or accelerated according to the dictates of this factor. Be that as it may, the complication of infection in a clean surgical wound is not only extremely humiliating to the surgeon but also gravely significant to the patient who, as a result, may sacrifice his life or at least undergo a prolonged period of hospitalization. Rigid as are the rules of operating room technic, there still remains a weak link somewhere in this chain of asepsis which makes possible the infection of a clean wound.

Hart<sup>1</sup> investigated this problem in a thorough manner and came to the conclusion that organisms entered the wound from the air rather than from the skin of the patient. The source of air contamination in his estimation was the operating room personnel and the patient and, furthermore, there appeared to be a definite correlation between the incidence of wound infection, the air contamination and the number of carriers. The offending organism in about 90 per cent of the cases was proved to be the staphylococcus aureus. In accordance with these findings, it has been noted at the St. Louis City Hospital over a period of years that the peak of wound infections occurred during the winter months when upper respiratory diseases were most prevalent.

Jensen and his coworkers<sup>2</sup> advocate the local implantation of sulfanilamide as a method of treatment of compound fractures and their results have proven highly satisfactory as measured by the reduction in infection of contaminated wounds. If the action of sulfanilamide is definitely bactericidal or bacteriostatic in contaminated wounds and reduces the incidence of infection, it seems that this drug might have some use in the prevention of infection in clean wounds. With this in mind a series of clean surgical wounds was treated by the implantation of sulfanilamide crystals in order to determine the efficacy of such a measure. Inguinal herniorrhaphy was chosen as the procedure best suited for this test because it was considered a fairly standard operation and afforded the best control methods. The experiment was carried out during the months of December, January and February because in past years this period had carried the highest percentage of wound infections.

Since in the St. Louis City Hospital there are three surgical units to which patients are admitted in rotation, not only was the problem of control groups simplified but also this method of assignment eliminated any possibility of the selection of cases. Sulfanilamide was implanted in the hernior-

rhaphy wounds of all cases admitted on one unit while the remaining units formed two control groups. As approximately 90 per cent of the operations were performed by a changing personnel of interns and assistant residents who rotated between the units under the supervision of the residents, this precluded the possibility of explaining the results on a basis of difference in aseptic technic on the part of any one surgical unit. The procedure followed was that of completing the suturing of the deep fascial layers in routine fashion and then sprinkling from 6 to 8 grams of sulfanilamide crystals into the subcutaneous tissues lying between the skin and the aponeurosis of the external oblique muscle. The postoperative care given was not varied in any way from that usually accorded such cases, the patient being sent home on the twelfth to fourteenth day after operation. The results of this experiment are summarized briefly but dramatically in table 1.

Table 1. Analysis of Infections in Clean Surgical Wounds

Group	Number Operations	Number Infections	Percentage Infections	Organism Infecting
Sulfanilamide Implantation	18	0	0	
Control A	19	2	10.5	1. Strep. hemolyt. 1. Staph. aureus.
Control B	25	3	12	2. Staph. aureus. 1. Strep. hemolyt.

### DISCUSSION

In the past history of therapeutics certain drugs have risen suddenly into medical popularity only to reach a climax of acclaim and then pass into the realm of the forgotten. Other drugs have fluctuated between favor and disfavor to finally assume a certain level of usefulness. Still others belonging to a minority group have continued to bask in the light of therapeutic acceptance and have proven their value over a period of years. Arduous and painstaking effort with a close correlation of the research and clinical facilities is essential for the proper evaluation of a therapeutic measure. This is the present status of sulfanilamide, a drug whose antibacterial powers and dangerous elements have yet to be analyzed completely.

It is not the purpose of this paper to foster a disregard for those essential factors so necessary in clean wound healing for sulfanilamide, or any other drug, never will replace these principles. Whipple<sup>3</sup> in a recent article reiterates the necessity of hemostasis, adequate vascular supply, rest and normal tissue metabolism as a prerequisite to the proper repair of wounds, and there is no question but that these elements of surgical technic must be obeyed in order to gain satisfactory results. Sulfanilamide is suggested as an added weapon in the surgeon's armamentarium which may be used in conjunction with these factors.

The optimum quantity of sulfanilamide to intro-

From the Department of Surgery, St. Louis City Hospital.

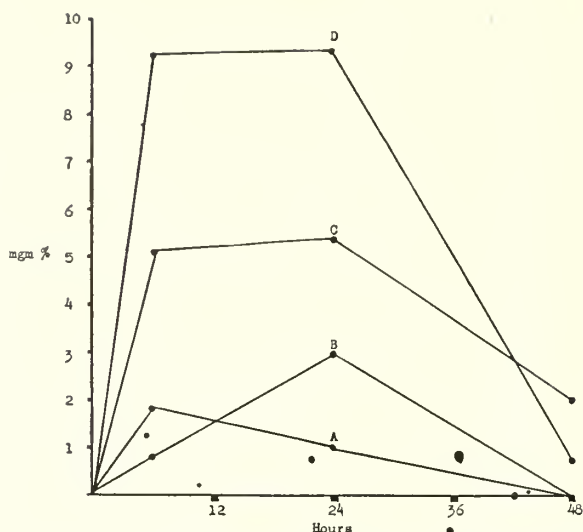


Fig. 1. Blood concentrations of sulfanilamide in four cases of herniorrhaphy in which 6 and 8 grams of sulfanilamide were implanted in the wounds. Cases A and B received 6 grams each while cases C and D each received 8 grams.

duce into a wound has not been determined but in this experiment from 6 to 8 grams were chosen as an arbitrary amount. It may be that a smaller amount, even half that used, would be adequate. The solubility of this drug in fluids at body temperature approaches 0.8 per cent, hence the concentration of the tissue fluids should approach 800 mg. per cent. This concentration far exceeds that considered satisfactory for the treatment of infections.<sup>4,5</sup> Using the method described by Marshall<sup>6</sup> the blood concentration of sulfanilamide was determined in four cases and these results are graphically portrayed in figure 1. These concentrations would indicate that a general therapeutic level of blood sulfanilamide is maintained over a longer period of time due to a slower continual absorption than is the case when the drug is administered by mouth.<sup>7</sup>

Bricker and Graham<sup>8</sup> demonstrated that sulfanilamide given to dogs by mouth in doses comparable to that used in human therapy has an inhibitory effect on wound healing. The authors state, however, that by the seventh day there was little difference in the tensile strength of the wounds in dogs treated with sulfanilamide and those not so treated. This factor must be considered seriously in relation to the implantation of sulfanilamide in clean wounds for it is well recognized that the success of a herniorrhaphy is dependent on firm fascial union. Although recurrences have not been observed in this series of cases further observations are necessary before any definite conclusions may be made.

An occasional complication which required attention in certain cases was the collection of a sterile, dark, serosanguineous fluid in the subcutaneous tissues some five to seven days following operation. This could be aspirated readily with a needle after which the fluid did not tend to reform or, if observed over a period of time, it eventually absorbed.

Bacteriological examinations revealed the fluid to be sterile. In one case a determination of the sulfanilamide concentration of material aspirated some ten days after operation revealed none of the drug present. The collection of this fluid is readily explained on the basis that the crystals of this drug act as an irritant to the tissues.

Cyanosis was not encountered in patients receiving 8 grams or less as was used in this series of herniorrhaphies; however, on several occasions when 10 or 15 grams of sulfanilamide were used locally in open nailings of fractured hips, this complication was noted. The seriousness of such a condition remains a somewhat debatable issue.<sup>9,10,11</sup> The symptoms were not in keeping with the cyanotic color for the patients maintained a normal respiratory rate and showed no evidence of dyspnea.

#### SUMMARY AND CONCLUSIONS

Sulfanilamide was implanted in the wounds of a series of eighteen inguinal herniorrhaphies in an effort to determine the efficacy of this drug as a prophylaxis against infection. Two control groups of approximately equal numbers were operated upon under similar conditions without the use of sulfanilamide. There were no infections in the group receiving sulfanilamide, whereas, the remaining control groups showed 10.5 per cent and 12 per cent infections respectively. These results are not to be interpreted as points favoring the disregard of those essential principles of aseptic technic so necessary to clean wound healing.

St. Louis City Hospital.

#### BIBLIOGRAPHY

1. Hart, Deryl: Operation Room Infections, *Arch. Surg.* **34**: 874-896 (May) 1937.
2. Jensen, N. K.; Johnsrud, L. W., and Nelson, M. C.: The Local Implantation of Sulfanilamide in Compound Fractures, *Arch. Surg.* **61**:1-12 (July) 1939.
3. Whipple, Allen O.: The Essential Principles in Clean Wound Healing, *Surg. Gynec. & Obst.* **70**:257-260 (February) 1940.
4. Aleya, E. P.; Daniel, W. E., and Yates, A.: Sulfanilamide Concentrations in the Blood and Urine, *J. Urol.* **41**:14-28 (January) 1939.
5. Raydin, I. S.; Rhoads, J. E., and Lockwood, J. S.: The Use of Sulfanilamide in the Treatment of Peritonitis Associated with Appendicitis, *Ann. Surg.* **111**:53-63 (January) 1940.
6. Marshall, E. K., Jr.: Determination of Sulfanilamide in Blood and Urine, *Proc. Soc. Exper. Biol. & Med.* **36**:422-424 (April) 1937.
7. Marshall, E. K., Jr.; Emerson, Kendall, Jr., and Cutting, W. C.: Para-Aminobenzenesulfonamide Absorption and Excretion: Method of Determination in Urine and Blood, *J. A. M. A.* **108**:953-956 (March 20) 1937.
8. Bricker, E. M., and Graham, E. A.: The Inhibitory Effect of Sulfanilamide on Wound Healing, *J. A. M. A.* **112**:2593-2594 (June 24) 1939.
9. King, F. H.; Leslie, A., and Byrne, G.: Oxygen Saturation of Arterial Blood in the Cyanosis from Sulfanilamide, *J. A. M. A.* **110**:2069 (June 18) 1938.
10. Wendel, W. B.: The Control of Methemoglobinemia with Methylene Blue, *J. Clin. Investigation* **18**:179-185 (March) 1939.
11. Bigler, J. A., and Werner, Marie: Cyanosis from Use of Sulfanilamide, *Am. J. Dis. Child.* **57**:1338-1342 (June) 1939.

Sulfanilamide is a simple and highly effective treatment for cerebrospinal meningitis (inflammation of the membranes, enveloping the spinal cord and brain), Kalei K. Gregory, M.D., Edward J. West, M.D., and Raymond E. Stevens, M.D., Providence, R. I., state in *The Journal of the American Medical Association* for September 28.



## KETOSIS SIMULATING ACUTE CONDITIONS OF THE ABDOMEN

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AND

N. W. DREY, M.D.

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The ability of ketosis, diabetic and nondiabetic, to simulate the acute abdomen has received relatively scant attention in the literature, especially the American. Our interest in this subject was aroused by the occasional cancellation of emergency operations after the discovery of ketosis and its successful treatment with the disappearance of all the signs and symptoms that had suggested operative interference.

McKittrick<sup>1</sup> reports seven cases, six from the literature, of diabetic acidosis with abdominal signs and symptoms that led to surgical intervention which in no case revealed the suspected lesion or any other that might explain the preoperative picture. Fischer<sup>2</sup> reported one case in which he operated for pancreatitis but postmortem examination showed only minute hemorrhages in the stomach and bowel for which no explanation seemed apparent at the necropsy; and Hamburger<sup>3</sup> mentions a case of presumed peritonitis in a precomatose diabetic child but postmortem examination failed to reveal a peritonitis.

There are many reported cases in which operation was deferred until means to correct the ketosis were applied, after which the change in the clinical picture made an operation unnecessary.<sup>4, 5, 6, 7, 8, 9</sup> Among 70 juvenile diabetic patients Newcomb<sup>10</sup> found two cases in whom a pseudoappendicitis picture was caused by ketosis, since insulin and fluids rapidly dispelled the confounding picture.

McKittrick,<sup>1</sup> Newcomb,<sup>10</sup> Beardwood,<sup>16</sup> Bothe and Beardwood<sup>17</sup> and others<sup>11, 12, 13, 14, 15</sup> have discussed in some detail the episodes of abdominal symptomatology encountered in large diabetic services. Bothe and Beardwood, reporting on a series of 1,260 admissions, found 136 cases in acidosis. Of these 102 revealed the triad of nausea, vomiting and abdominal pain and eighty-seven showed an associated leukocytosis. Unfortunately their statistical study does not include abdominal signs. At the Jewish Hospital, St. Louis, of 1,343 cases of diabetes representing 1,720 admissions to the hospital, thirty-eight were in frank acidosis. Twenty revealed nausea and vomiting and abdominal pain; eighteen showed leukocytosis.

A similar diagnostic problem occasionally presents itself in cases of cyclic vomiting or acetonemic crisis. Krabbel,<sup>18</sup> Macera and Domensch,<sup>19</sup> Huet<sup>20</sup> and Glorieux<sup>21</sup> describe the removal of normal appendices from patients whose symptoms were due

to acetonemic crisis. The cases of Macera and Domensch and Huet had recurrent attacks during ketosis. In six similar cases Glorieux dissipated the clinical picture of pseudoappendicitis by treating the ketosis.

The frequency of the problem becomes apparent from Wiese's<sup>22</sup> forty cases of acetonemic crisis observed in a group of afebrile tuberculous children under constant observation in a convalescent sanatorium. Fourteen of these simulated acute appendicitis, but in no case was operation even considered for the prodromata were well observed and correctly interpreted and antiketogenic therapy applied to the pseudoappendicitis cases resulted in prompt return to normal.

This study consists of eight cases, five diabetic and three nondiabetic, in which ketosis created a surgical problem.

### REPORT OF CASES

Case 1. I. C., white, single female, aged 20, was admitted to the hospital complaining of severe epigastric pain, nausea and vomiting. Her physician had noted general abdominal tenderness and muscle resistance, especially on the right side, and urgently advised hospitalization as a case of suspected acute appendicitis. Upon admission the abdominal findings were confined to generalized abdominal tenderness. Her past history showed a 16 pound weight loss in the previous two and one half months but no excessive thirst, hunger or urination. There had been upper abdominal pain intermittently for a year, never associated before the present episode with nausea and vomiting. Marked glycosuria and ketonuria were present. The blood sugar was 193 mg. per cent, the pulse 100, the temperature 99.0 F. per rectum and the white blood count 7,300. Diabetes mellitus was diagnosed and surgical intervention postponed. Under an appropriate regime the signs and symptoms cleared rapidly and entirely.

Case 2. I. Z., white, married female, aged 38, a known diabetic, entered the hospital to undergo metabolic tests scheduled for the following morning. Her usual evening insulin was omitted. Nausea and vomiting commenced at midnight and were followed a few hours later by severe generalized abdominal cramps. Examination revealed a fast, thready pulse and a temperature of 99.0 F. per rectum. The abdomen was soft but quite tender generally. There was marked ketonuria. The white blood cells numbered 37,750 with a marked shift to the left in the Schilling count. Appendectomy was seriously considered but the ketonuria, nausea, vomiting and abdominal tenderness rapidly subsided under diabetic management.

Case 3. H. R., male, aged 14, a known diabetic who had been taking 30 units of insulin morning and evening, had a severe vomiting attack forty-eight hours before admission. The next day he felt well but omitted his evening insulin. The morning of his admission he was awakened by severe abdominal cramps associated with nausea and vomiting. Upon admission in semistupor, rapid, pauseless respirations were noted. The tongue was dry and there was acetone breath. The abdomen was rigid and generally tender. The blood sugar was 548 mg. per cent; the urine showed marked glycosuria and ketonuria. The white blood count totaled 33,000, with a marked left shift in the Schilling count. Because of the history and findings acute intestinal obstruction was believed present. A roentgen ray of the abdomen was reported normal with regard to signs of obstruction. A diabetic regime necessitating large doses of insulin was instituted and the clinical picture cleared rapidly. The white blood count dropped to 17,-

From the Surgical and Medical Services of the Jewish Hospital and the Department of Surgery, Washington University School of Medicine, St. Louis.

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500 within twelve hours and to 6,100 within sixty hours after admission.

Case 4. H. W., white female, aged 19, was observed in the hospital for almost twelve months because of the unusual state of her carbohydrate metabolism. Her condition was one of extreme instability with phases of severe diabetes punctuated by hypoglycemic reactions alternating with periods of greater stability during which insulin was unnecessary. She had been seen at several institutions previously. Six months before entering the Jewish Hospital she had been admitted to a hospital in a state of precoma. She complained of dull nonradiating pain in the right lumbar and lower abdominal quadrant regions which she had noticed especially after exercise for the last three years. The pain had become much worse three days before hospitalization and was associated with nausea and vomiting. The nausea antedated the pain and vomiting by four days. Essential findings included deep pauseless respirations, mild irrationality and rapid small pulse. There was some generalized abdominal resistance but no involuntary muscle guard. There was deep tenderness in the right flank and general abdominal soreness. The temperature was 99.4 F. per rectum, the blood sugar was 617 mg. per cent and the white cell count was 17,000 with marked shift to the left in the Schilling count. There was marked acetonuria but tests for diacetic acid were not made. The medical resident felt that there was no true acute abdominal condition present. The surgical consultant, seeing the case for the first time shortly thereafter, felt that an acute appendix accounted for the picture and operation was performed that evening. At operation a "subacute" appendix was removed which on histologic examination failed to show any evidence of recent inflammatory reaction. The patient made an uneventful recovery but continued to have the same pain as experienced preoperatively. Before discharge, thorough study of the genito-urinary and gastrointestinal systems was conducted but shed no light on the pain. The blood sugar and urine examinations revealed marked instability during this entire period and although ketonuria was not followed it must have been present at intervals, because when the patient came under our subsequent observation transient attacks of lower abdominal pain occurred during periods of ketosis.

Case 5. A. L., obese female, aged 31, was admitted to City Hospital on March 24, 1938, with a history of abdominal cramps of eight hours standing and pain in the right lower quadrant for two hours. The patient was nauseated but had vomited only once. On admission her temperature was 99.8 F. per rectum, pulse 96 and respiration 68. Essentially, the physical examination elicited general abdominal tenderness without rigidity. There was acute tenderness over McBurney's point and rebound pain was definitely present. The pelvic examination gave normal findings except for some midline and right adnexal tenderness on bimanual palpation. Smears for gonococci were repeatedly negative. The white cell count was 11,150 with a moderate shift to the left. The urine showed marked glycosuria and ketonuria. The opinion of the gynecologist was acute appendicitis. The surgical consultant agreed but the presence of ketosis weighed heavily in the determination to treat this patient conservatively with antiketogenic therapy. Accordingly she was given fluids and insulin parenterally and within twelve hours the entire clinical picture cleared except for a remnant of abdominal soreness.

Case 6. D. G., white female, aged 11, was admitted to the surgical service with a diagnosis of subacute intestinal obstruction. The child had a poliomyelitis residual in the form of flaccid paralysis of the lower extremities. The leading complaints on admission were vomiting and colicky abdominal pain for three days. There was no abdominal distention nor rigidity but there was the sensation of an indefinite mass in the

right lower quadrant. Palpation caused no acute nor localized pain but did exaggerate general abdominal soreness. Reexamination somewhat later revealed a sense of resistance in the right lower quadrant which was absent elsewhere. Borborygmi were heard over the entire abdomen except over the right lower quadrant. Rectal examination gave normal findings. There was frank ketonuria and leukocytosis of 12,000. Intestinal obstruction or a smoldering appendix was diagnosed. At operation a normal appendix was removed, no lesion being encountered to explain the findings. Glucose was given parenterally and the child made an uneventful recovery.

Case 7. I. J. K., white male, aged 26, was admitted to the surgical service with a diagnosis of subacute intestinal obstruction. His principle complaints were constipation and vomiting. He had had a poor appetite for three weeks and had been markedly constipated over a similar length of time. For twelve hours prior to admission he had been vomiting intermittently a mucoid, green tinged emesis. There was no nausea, but there was generalized abdominal pain and pain in the back of the neck. His temperature was 100.0 F. per rectum; the pulse was 90. Examination of the abdomen revealed no distention nor peristaltic waves. There was generalized tenderness and there seemed to be a degree of rigidity in the right upper abdomen. There was an old midline operative scar for a previous condition said to have been peritonitis. Rectal examination gave normal findings. The urine showed a trace of albumin and marked ketonuria; there was a leukocytosis of 12,000. While operative interference was being considered, he was observed for a few hours during which time enemata and small feedings were attempted with the symptoms and findings abating. These were interpreted, on discharge, as resulting from a starvation ketosis.

Case 8. R. K., white female, aged 5, was admitted to the hospital with chief complaints of vomiting and pains in the stomach. The history revealed that the child was a poor eater and that she had vomited intermittently for four days, complaining during most of this time of pains about the navel. Examination showed a degree of dehydration and the abdomen was generally tender to palpation. There was marked ketonuria, no glycosuria and a leukocytosis of 15,750. The abdominal pains and vomiting quickly disappeared after parenteral fluids and glucose.

#### DISCUSSION

Ketogenesis in these cases is probably of the same basic origin. The ketone bodies are formed in the liver in abnormal amounts whenever glycolysis fails to keep pace with glycogenolysis so that a glycogen depletion results. This obtains in cyclic vomiting, anorexia nervosa and chronic malnutrition when the starvation factor is present. In diabetes mellitus accelerated glycogenolysis probably due to the lack of adequate insulin supply is the fundamental cause for increased ketone formation.

The history of each case is important in establishing the correct diagnosis. It can be determined in the majority of cases that vomiting precedes abdominal pain and that nausea, if present, comes on late. In diabetic coma, nausea, vomiting, diarrhea and drowsiness almost always occur before the onset of pain and this is at variance with the classic sequence in appendicitis. However, the progression of the symptomatology of the pseudo-acute condition of the abdomen and of appendicitis do not always conform to the classic picture.<sup>1</sup>



The pain is more frequent in the upper abdomen but occurs also in the lower abdomen and may be continual or intermittent. The pain seems to be greater on the right side. Absence of localized tenderness predominates in the pseudo-acute condition of the abdomen even when the pain is localized. Muscle guard is never really present locally but is suggested at times by the rigidity which is usually widespread. A generalized hyperesthesia frequently occurs.<sup>23</sup> McKittrick<sup>1</sup> and Hartmann<sup>26</sup> feel that dilatation of the stomach and hepatomegalia<sup>24,25</sup> may contribute to the production of the symptomatology of the pseudo-acute condition of the abdomen.

The leukocyte response also bears watching for both Allen<sup>5</sup> and Schondube<sup>6</sup> have shown the relatively rapid fall in the counts to within the normal range as illustrated by case 3. Allen was the first to mention the leukocytosis associated with diabetic acidosis and showed that it occurs in the absence of any infectious process. Crecelius<sup>4</sup> and Scherk<sup>27</sup> report no change in the leukocyte count or abdominal symptoms when actual abdominal inflammatory processes are present no matter how adequately the associated ketosis is treated with insulin, fluids and glucose.

John<sup>28</sup> feels that leukocytosis without fever may be a differential point between uncomplicated acidosis and acidosis in which infection is present. Beardwood<sup>16</sup> studied this statistically and found that in 1,000 diabetic cases 114 were in acidosis, and 81 of these gave a history of abdominal symptoms. Of this latter group 69 showed leukocytosis and 64 had slight temperature elevations. These figures and our experience lead us to believe that the temperature should not be emphasized as a point of differential diagnosis.

In cases of pseudo-acute conditions of the abdomen, the degree of ketosis as evidenced by the ketonuria is of some value. The presence of traces of acetone is not significant but, when acetone is frank and diacetic acid is present, there is evidence of more ketogenesis than would ordinarily occur with an intra-abdominal lesion of surgical significance. The presence of diacetic acid speaks for either a process of some standing or one in which ketosis is a prime factor, and it is in these cases that special care must be exercised. Glycosuria associated with the ketonuria immediately raises the question of diabetes mellitus, which must be weighed in the evaluation of any other factors presenting themselves.

The response to antiketogenic therapy is dramatic and there is unanimity of opinion that the response or lack of it is the most important point upon which the correct diagnosis hinges. In Walker's<sup>9</sup> case board-like rigidity vanished in forty-five minutes. We have noticed similarly rapid dissipation of ominous findings in our cases. The promptness of response and continued observation during the period of therapeutic trial cannot be overemphasized.

## SUMMARY

The problem of pseudo-acute conditions of the abdomen in ketosis of diabetic and nondiabetic origin has been presented with case reports.

From the standpoint of establishing the correct diagnosis in these cases, a careful history and trial observation period with rigorous antiketogenic therapy is advocated.

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## BIBLIOGRAPHY

1. McKittrick, L. S.: Abdominal Symptoms With or Without Abdominal Lesions in Diabetic Acidosis, *New England J. Med.* **209**:1033, 1933.
2. Fischer, A. W.: Quoted by Crecelius.<sup>4</sup>
3. Hamburger: Quoted by Crecelius.<sup>4</sup>
4. Crecelius, W.: Peritoneal Symptoms and the Blood Picture in Diabetic Coma, *Klin. Wchnschr.* **8**:878, 1929.
5. Allen, F. N.: Diabetic Acidosis and Leukocytosis, *Am. J. Med. Sc.* **174**:506, 1927.
6. Schondube, W.: Concerning the Cause of Peritoneal Symptoms Associated With Diabetic Precoma, *Deutsche med. Wchnschr.* **56**:183, 1930.
7. Del Sel, M.: Acute Abdominal Syndrome During Coma and Precoma, *Prensa med. argent.* **26**:612, 1939.
8. Weichman: Quoted by Crecelius.<sup>4</sup>
9. Walker, H.: The Etiology of Abdominal Pain in Diabetic Acidosis, *Ann. Int. Med.* **9**:1178, 1936.
10. Newcomb, A. L.: Acute Abdominal Pain in Juvenile Diabetes, *Illinois M. J.* **68**:544, 1935.
11. Joslin, E. P.: *Diabetes Mellitus*, Philadelphia, Lea and Febiger, 1937.
12. Root, H. F.: Diabetic Coma and Its Treatment, *M. Clin. North America* **7**:641, 1923.
13. Joslin, E. P.; Root, H. F., and White, P.: *Diabetic Coma and Its Treatment*, *M. Clin. North America* **8**:1873, 1924.
14. Lowenberg and Joel: Quoted by Crecelius.<sup>4</sup>
15. Melchior: Quoted by Crecelius.<sup>4</sup>
16. Beardwood, J. T.: Abdominal Symptomatology of Diabetic Acidosis, *J. A. M. A.* **105**:1168, 1935.
17. Bothe, F. A., and Beardwood, J. T.: Evaluation of Abdominal Symptoms in the Diabetic, *Ann. Surg.* **105**:516, 1937.
18. Krabbel, Max: Acute Appendicitis and Periodic Vomiting (Acetonemia) in Children, *Zentralbl. f. Chir.* **55**:781, 1928.
19. Macera, J. M., and Domench, A. L.: Association of Appendicitis and Acetonemia, Report of a Case, *Semana med.* **1**:1094, 1932.
20. Huet, P.: Differential Diagnosis of Acute Appendicitis and Acetonemic Crisis, *Prat. med. franc.* **14**:351, 1933.
21. Glorieux, P.: Pseudo Appendicitis or Acute Attacks of Acetonemia, *Arch. med. belges* **88**:265, 1935.
22. Wiese, O.: Study of Acetonemia and the Occurrence of the Clinical Picture Resembling That of Appendicitis, *Kinderartzl. Praxis* **5**:201, 1935.
23. Van Noorden, Die Zuckerkrankheit, Berlin, Hirschwald, 1912.
24. Marble, A.; White, P.; Bogan, I. K., and Smith, R. M.: Enlargement of the Liver in Diabetic Children, *Arch. Int. Med.* **62**:740, 1939.
25. Hansen, P.: Enlargement of the Liver in Diabetes Mellitus, *J. A. M. A.* **106**:114, 1936.
26. Hartmann, A. F.: Personal communication.
27. Scherk, G.: The Origin of Peritoneal Symptoms in a Precomatose Diabetic, *Deutsche med. Wchnschr.* **55**:1878, 1929.
28. John, H. J.: Diabetic Coma in Children, *Am. J. Digest. Dis. & Nutrition* **1**:569, 1934.

## WHY UNEXERCISED MUSCLES ARE FLABBY

When muscles are not used, structural changes actually occur and wasting of the muscles results, *Hygeia*, *The Health Magazine* states in answer to an inquiry as to why muscles become "flabby" if exercise is discontinued.

"When a muscle contracts, energy is expended, and some of the cells are broken down by combustion," *Hygeia* says. "The muscle cells proceed to absorb from the surrounding blood plasma additional food materials. Thus muscular activity results in a constant change of some of the elements of the muscle itself, which is kept in a state of increased efficiency in proportion to its reasonable use. The fibrous portions of muscle become hardened and tough, and both the size and number of muscle cells are increased by exercise. The lack of exercise therefore causes the muscles to become 'flabby' and to lose tone."

## IS DENTITION AN ETIOLOGICAL FACTOR IN ORGANIC AS WELL AS FUNCTIONAL DERANGEMENT OF INFANTS?

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This subject has received little mention in the literature but has caused much general discussion by the laity as well as the medical profession. Modern textbooks of pediatrics only casually mention teething as a factor in the upsets of infants, usually not more than a paragraph or two being devoted to this subject. The diseases thought to be due to teething have been accepted generally by the medical profession as a natural fact since time immemorial and this idea is well settled in the minds of the laity. Those of the profession who have not agreed with this idea have been few in number. The list of illnesses accredited to dentition have shortened gradually until at the present time the list is quite small. However, one would be surprised to know the number of physicians that still adhere to the old ideas. By careful analysis and careful physical examination of each case the list of diseases has become smaller each year for through these means disorders have been shown to have a definite pathological basis, dentition being only coincident.

All grandmothers express a feeling of fear and apprehension when an infant in the family begins teething, especially if it should be during the summer months. They know that many infants die of summer diarrhea and in their minds this is one of the many diseases or complication of teething. To convince them to the contrary would be difficult.

I have never attempted to convince the laity that teething is a physiological process, proceeding in a normal manner and causing practically no disturbance in the infants well-being but I will try to convince the physician who may read this article that this is the fact.

In recent years focal infections have been found to play an important part in the causation of many diseases and the teeth being the primary focus of infection has been stressed by many authors and clinicians. This no doubt strengthens the idea among the laity that systemic disorders in infants result from dentition. I do not believe that alveolar abscess and dentition bear any relationship whatever. The former is a disease of childhood or adult life usually resulting from neglect in the care of the teeth, nutritional disturbances, general systemic pathological conditions or congenital malformation or deficiency. The latter is a purely physiological process and is confined, at least for the scope of this paper, entirely to infancy.

To tell the mother of a sick infant that the erupting teeth are the causative factor does save much time and trouble on the part of the physician but works a hardship on the infant for it does not explain the real cause of the trouble. To me such a

statement is only an excuse for a hurried examination and call. How many of these doctors that lay the blame on the teeth carry a dependable flashlight so that the throat may be carefully examined or an up-to-date electrical otoscope to examine the ears carefully? How many of these men go to the trouble to ask that the stools and urine be examined? I will venture to say it is a small percentage and of this number that do I believe that I could safely say that none of them will lay the blame on the teeth because they will discover the true cause of the trouble.

In my opinion dentition plays no part in the causation of organic disease and there is great doubt in my mind if dentition has much to do with the functional disorders of infants. A mother will tell one that her baby is cross, fretful, does not sleep and that noise seems to frighten it and she can think of nothing but the fact that the infant is teething to account for the trouble. How many infants and children are of a peaceful, loving disposition all the time? I should say not many. And would it not be just as proper for the doctor, or the mother, to place the blame on some displaced or subluxated vertebrae as to place the blame on the teeth? To make a diagnosis of teething diverts the mind from the essentials which are food, air, sunshine and hygiene. It should be a habit to inquire into the environment of the infant, its hygienic care, the amount and kind of clothing, the amount of fresh air in the sleeping room at night and the amount of sunshine they receive during the day. These things are of minor importance to many but really they constitute the essential matters to be considered. Improper food and lack of sunshine produce two common diseases of infants, rickets and tetany. Perhaps it is to the symptoms of these two diseases that the mother refers when she describes symptoms and one has no right to dismiss them without first making careful examination of the baby and a searching inquiry as to his food and hygiene.

I have never agreed with the idea that infants when cutting their teeth are continually chewing or biting hard substances to relieve the pain since pain or tenderness would be increased rather than decreased by biting on hard substances. Drooling which accompanies dentition is not a symptom of teething but merely betokens the establishment of a flow of salivary secretions at that time.

Physicians and laymen alike refer to tooth rash, supposedly a skin eruption resulting from dentition. I have yet to see such a rash. Upon investigation the eruption will be found to be due to lack of cleanliness, improper bathing, unsuitable clothing, improper food or some inherited peculiarity of the skin.

I believe summer diarrhea is the disease most commonly accepted as due to dentition. This is a dangerous belief because the true cause is thus overlooked and the infant may succumb from misdirected therapy. Diarrhea owes its origin to al-



together different causes which are definite and which cannot be overlooked and have a happy ending for the case. One should remember that during this period the infant is weaned or at least is beginning to take foods more or less unsuited to its digestion and as a consequence diarrhea in its various forms results. For the last decade I have become more and more convinced that the vast majority of diarrheas are due to a secondary involvement of the gastrointestinal tract from a primary upper respiratory infection.

I frequently hear physicians refer to swollen inflamed gums but to me this is a rare observation. It is true that the gum is swollen but only as a result of the advancing tooth beneath. As a rule there is but little change in the color of the gum except that portion which lies directly over the erupting cusps which is generally more blanched than the surrounding gum due to the pressure exerted upon it. And it seems improbable that this blanched gum tissue should produce any severe pain. Rubbing these gums in my opinion rarely hastens the eruption of the tooth but often delays the progress by the resulting scar tissue and the physician who carefully examines a sick infant has little or no use for this procedure.

It is not my wish to be dogmatic or eccentric in any way but I have not been convinced in my practice that dentition is a factor in the disease or upsets of infants. In conclusion I want to emphasize the importance of, and plead for, the more general use of careful painstaking examination of all sick infants so that the true cause of the illness may be discovered.

222 Plaza Theatre Building

#### PRESENT ADDED EVIDENCE OF VALUE OF VINETHENE ANESTHESIA

Additional evidence of the value of vinethene, a quick acting anesthetic chemically related to ether, is presented in *The Journal of the American Medical Association* for October 19 by Huberta M. Livingstone, M.D., Geraldine A. Light, M.D., A. Fausteena Heidrick, M.D., and Vera N. Kable, M.D., Chicago.

Vinethene is an anesthetic administered in the same way as ether but differing from the latter in the rapidity of its action. This property necessitates special caution in its administration because it is easy to pass from the stage required for surgery to that of dangerous over-dosage. Its value lies in its rapid action and the prompt recovery which follows the administration of the drug.

"The use of this rapidly acting agent," the four physicians say, "should have its place in war surgery, particularly in areas free from fire and explosion hazard. Short, painful procedures can be satisfactorily cared for under this agent, and the rapid return to complete consciousness will lessen the postoperative care."

The authors say, "From clinical experience in 2,050 administrations we feel that vinethene anesthesia, particularly for short operations when patients are to be ambulatory (no longer confined to bed) soon thereafter, and as an induction agent when indicated, has a definite place in the surgical armamentarium (equipment)."

#### PNEUMONIA CONTROL

In the article by Dr. E. Sigoloff, St. Louis, on "The St. Louis Pneumonia Control Program" which appeared in the October issue of *THE JOURNAL*, figures 1 and 3 were transposed. They should have appeared as follow:

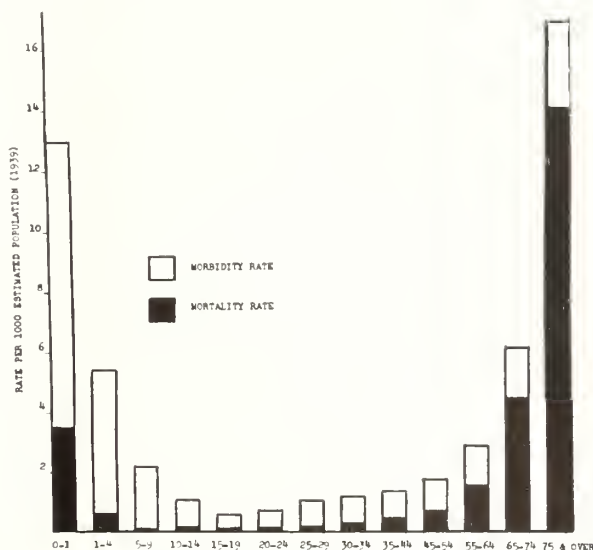


Fig. 1. Morbidity and mortality rates from pneumonia per 1,000 estimated population by age groups.

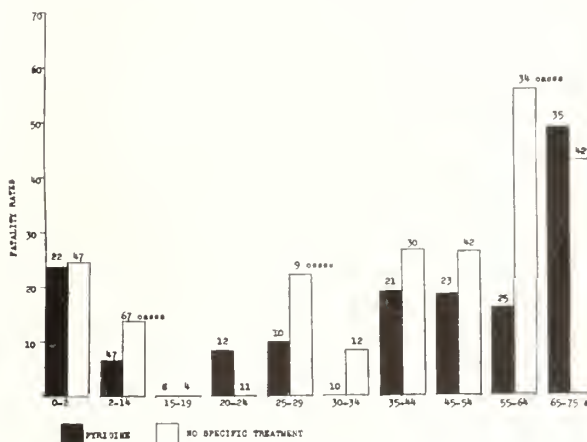


Fig. 3. Comparison of effects of pyridine and no specific therapy on pneumococcus pneumonia by age groups.

#### NEW SUBSTANCE FOR COVERSLEIPS IN LABS

A new material, plastacele, has proved satisfactory as a substitute for the small glass coverslips used for microscopic laboratory work, the supply of which has been threatened by the European War, Jack C. Norris, M.D., Atlanta, Georgia, reports in *The Journal of the American Medical Association* for September 28.

Glass coverslips have been imported from Germany, England and Japan. Since the beginning of the war, their price has increased from \$1.50 to \$3.75 an ounce, making their use almost prohibitive to the average hospital laboratory. The new plastacele coverslips, which are perfectly transparent, are slightly less expensive than the imported ones were at prewar prices.

## SPECIAL ARTICLE

THE RELATIONSHIP OF PHYSICIANS  
AND DENTISTS

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Medicine and dentistry have much in common. Both professions have identical goals—the promotion of health and the prevention and cure of disease. Dentistry needs the medical viewpoint and the benefits of medical knowledge and there is every reason to believe that medicine can benefit from the dental viewpoint and from dental knowledge.

It often is assumed that dentistry is a branch of medicine. This is not literally true; at least not in the same sense that obstetrics, pediatrics, radiology, dermatology and ophthalmology are branches of medicine. A dentist cannot practice medicine without an M.D. degree, nor can a physician practice dentistry without a D.D.S. or D.M.D. degree. There is, nevertheless, a close relationship between medicine and dentistry.

American dentistry, as it is known today, was conceived by dentally minded physicians one hundred years ago with the founding of the Baltimore College of Dental Surgery. This group of dental enthusiasts took upon themselves the responsibility for the care of the teeth and mouth. This move apparently was agreeable to medicine at that time for the care of the teeth and mouth was readily, almost eagerly, delegated to this self-elected group. For a number of decades after that dentists became highly skilled technicians and gave little thought to the teeth and mouth as important organs in the body economy. Then came the observations of Hunter, whose findings brought such startling revelations that the practice of dentistry was reversed almost overnight and both medicine and dentistry awakened to the realization that a positive relationship existed between mouth conditions and many systemic diseases. In recent years medicine has demonstrated its interest in the far-reaching influence that dental infections may have on the general health.

During its earliest years as a profession dentistry was not looked upon with much favor by the medical profession. There is reason to believe, however, that the respect of medical men for dentistry has increased slowly but steadily. This is shown by the fact that in 1926 an official resolution regarding the title "Doctor" was passed by the American Medical Association at its annual meeting. The last paragraph of this resolution reads: "Resolved that for the protection of the public the title 'Doctor' in a medical sense be restricted to doctors of medicine and doctors of dental surgery."

Some strained relationships between medicine

and dentistry have existed even in recent years when the focal infection theory became prominent. Physicians would gaze in the mouths of their patients presenting rheumatic or arthritic symptoms and on noticing crowns, bridges and devitalized teeth, would forthwith dispatch them to their dentist for the immediate removal of these teeth. It cannot be denied that the dental profession deserved criticism in many instances, but fortunately modern dentistry has realized its shortcomings and is now placing more and more emphasis on a broader training in clinical medicine, pathology, physiology, anatomy, physiological chemistry, bacteriology and allied subjects in the training of dental students which, I believe, gives the modern dentist a more adequate biological background and viewpoint.

Every reasonable argument indicates that there is an interdependence of medicine and dentistry as shown by the fact that some diseases of the mouth are due primarily to disturbances elsewhere in the body and that certain systemic diseases may extend to involve the mouth.

Modern dentistry is no longer restricted to oral restorations and mechanics. In the general advancement of medical and dental knowledge, it becomes increasingly apparent that medicine and dentistry can be intelligently developed only with a more intimate association. The dental practitioner often is given the first opportunity to recognize early symptoms of disease. Lesions of the teeth, oral mucosa and submucosa are often significant of systemic or infectious diseases. Many times the dentist is the first to observe symptoms of pathology and can call them to the attention of the family physician, the internist, pediatrician, dermatologist or other specialist in the medical sciences. For instance, the alert dentist can recognize the oral manifestations of malignancies; or blood diseases such as leukemias, malignant leukopenia, pernicious anemia and sprue; or vitamin deficiencies such as scurvy and rickets; or glandular diseases such as hypothyroidism and Addison's disease; or chronic infections such as syphilis and lead or other metallic poisonings; or acute infections such as rheumatic fever, measles, Vincent's infection, scarlet fever, Ludwig's angina, diphtheria and many others.

Bloodgood of Johns Hopkins has said: "To a large extent, the decrease in the number of deaths from cancer of the oral cavity is in the hands of the dental profession. Cancer of the mouth is noted for its malignancy." The dental profession recognizes its responsibility in calling to the attention of the physician potential cancer lesions and other malignancies of the oral cavity.

In order to be of the best possible service to his patients, the dentist must depend on the physician for assistance in diagnosis and medical treatment. The dental profession, in turn, is in possession of certain facilities which are important to the medical profession.

Read before the staff of General Hospital, Kansas City, Mo., April 2, 1940.



For a number of years dental authorities have emphasized the importance of complete roentgen ray diagnosis. Just as medical diagnosis is not complete without an oral examination, so is a dental diagnosis not complete when it does not include roentgen ray studies of the teeth and supporting structures. Dental roentgenograms are indispensable in diagnosing chronic root end and residual infections, cysts, impactions and approximal cavities. The wise dentist collaborates with the physician in clinical diagnosis; but, similarly, the physician should accept the dentist's interpretation of dental roentgenograms.

There have been misunderstandings occasionally between physicians and dentists in the reading of oral roentgenograms and over decisions to extract or not to extract teeth. Personally, I believe both professions have been at fault. Fortunately, the wave of mass tooth extractions in cases of rheumatic symptoms is subsiding. Modern dentistry has greatly improved its diagnostic procedures which the medical profession should depend upon.

Physicians and dentists always should bear in mind the biologic and pathologic consequences of oral lesions, but both professions should keep in mind that there are other sources of focal infection besides the teeth. Too often a patient's teeth were condemned and extracted on general suspicion and when the symptoms did not clear up the infection was later found to originate in the appendix, gall-bladder, prostate, seminal vesicles, tonsils or sinuses. More careful clinical diagnosis, with the dentist as an active consultant, has saved many a harmless tooth in recent years. On the other hand, if evidence warrants it, the dentist should be the first to recommend sacrificing his most beautiful piece of mechanical work, no matter if only a few days old, if the teeth supporting it jeopardize the patient's health.

It is sometimes difficult to determine where a dental problem ends and a medical problem begins. It has been suggested that the dentists and physicians can cooperate best by recognizing the limitation of their respective fields. The relationship, however, should be one of reciprocal cooperation in practice and in research for the common good. Physicians and dentists should cooperate closely in the matter of records. It has been suggested that all medical records carry the name of the patient's dentist and all dental records carry the name of the patient's physician. Often on asking the patient who his physician is, the information is obtained that the patient is currently under treatment for a condition which would contraindicate the administration of local or general anesthetics or prolonged dental operations. The danger of extracting teeth for diabetics when their blood sugar is high, or of subjecting cardiac patients to undue surgical shock are well known. Lately, the attention of the dental profession has centered on diet as a factor in controlling dental caries or in controlling periodontal diseases. In such cases it is the duty of the dentist

to consult the patient's physician to obtain a knowledge of the general systemic condition of the patient so that the diet prescribed would not be detrimental to the general health.

The physician on his part should realize that the teeth and the jaws are made of structural elements quite different from other parts of the body and that treatment of disease in these tissues, even when of partially systemic etiology, is of a highly local nature. To be perfectly frank, it has been my experience that the average physician does not, or cannot, make a thorough dental examination. Some physicians prescribe mouth washes for periodontal diseases and when the condition does not improve will then refer the patient to a dentist for treatment. This delay is detrimental to the best interest of the patient since early and proper treatment is important to the success of all therapeutic measures, medical or dental.

Opportunities for cooperation between physicians and dentists are practically unlimited. The dental structures of children present early symptoms of deficiency diseases which should interest both the physician and the dentist. Some authorities believe that extensive tooth decay in young children is associated with rickets and may be an indication of a disturbance of calcium and phosphorus metabolism or disturbances of digestion. The family physician or pediatrician undoubtedly would be interested in the dentist's observations in these cases. In conditions of pregnancy, advice on oral hygiene, nutrition and proper oral prophylactic treatment have been found of value to the mother in preserving her own teeth and as a means of reducing toxemias.

Of special value is the cooperation of the dentist and surgeon in the performance of plastic operations of the face and jaws. Most of the larger hospitals now have dental departments for both outpatient and inpatient treatment. Dental interns and clinic workers are now well established factors on hospital staffs. In many universities the medical students now are learning more of oral anatomy and pathology and it is certainly true that dental students are receiving more of the medical viewpoint than ever before. That physicians ought to have just as great a concern for the teeth as for any other portion of the body in dealing with health problems, and that dentists should be trained to care for the teeth in the light of knowledge of the whole organism is beginning to be appreciated.

In the field of research, the cooperation of the dentist and physician is most important. Research in dentistry is not the task for dentists alone but requires the cooperation of general clinicians, pathologists, bacteriologists and physiological chemists. Several medical and dental schools are now granting scholarships to dentists for research in dental pathology.

Dentistry, like medicine, is constantly seeking

more effective preventive methods. Most of the dental diseases are not spectacular diseases like syphilis, tuberculosis, diphtheria, typhoid and smallpox. In some ways this might be unfortunate since dental caries is one of the the most neglected diseases. Effective control measures for communicable diseases are the result of isolating the specific organism causing the disease. Although some progress has been made in determining the etiology of dental caries, there yet is not sufficient knowledge to rely on specific preventive agents such as are used to produce immunity to diphtheria, smallpox and typhoid.

It may be of interest at this point to outline briefly the results of recent research to determine the etiology of dental caries. Some of the best research authorities are concerning themselves with this problem. Although the prevention of caries, like the prevention of "the common cold" and cancer, awaits further discovery, some facts have been fairly well established:

1. The most constant differential between caries-free and caries-susceptible persons thus far demonstrated is the relative number of *L. acidophilus* organisms in the mouth. This correlation is approximately 90 per cent positive.

2. An immunologic principle related to *L. acidophilus* has been demonstrated in blood of caries-free persons in whose mouths, as a rule, *L. acidophilus* organisms do not exist and when planted therein promptly disappear.

3. Sugar is an important causative factor in caries. A remarkably low degree of caries was observed in children on a low sugar diet although deficient in calcium, phosphorus and vitamin D. Active caries was induced in children by increasing the sugar intake while they were receiving a diet that nutritionally was adequate.

There has been some criticism of the use of the term "preventive dentistry" since it has been pointed out that there are no known methods which can be used to produce an immunity to dental disease. It should be pointed out, however, that preventive medicine covers a broad field and includes personal hygiene, early physical examination and sanitation. Preventive dentistry, as it is known today, is based on a protective diet, periodical inspection of oral tissues, early correction of defects, mouth cleanliness and prophylactic odontotomy.

The several problems I have mentioned are mutual problems of medicine and dentistry. With the dentist and physician working together more constructive help can be given to the patient and progress can be made within the professions for the common good.

State Board of Health.

#### BIBLIOGRAPHY

- McCall, J. O.: Fundamentals of Dentistry in Medicine, The Macmillan Company.  
Research Commission of the American Dental Association: Dental Caries.  
Salzmänn, J. A.: Principles and Practices of Public Health Dentistry, The Stratford Company.

#### UNINTERRUPTED SUPPLY OF DOCTORS IS ESSENTIAL FOR PREPAREDNESS

"An uninterrupted supply of qualified doctors of medicine to meet the future demands of adequate national preparedness and the needs of the civilian population is vital to the future of our nation," *The Journal of the American Medical Association* for October 12 declares. "The Committee on Medical Preparedness of the American Medical Association urged last July that preparation for the conscription of the man power of this country should include provision for the continuation of medical education of students in medical schools and of interns in approved institutions. The Selective Training and Service Act of 1940 does defer the conscription of students in schools but only until next July. Specific deferment is not provided for those who may be completing their medical training as interns or as residents.

"An amendment has now been proposed to the Selective Training and Service Act of 1940 by Senator Murray of Montana in the form of a bill, S. 4396, providing that 'medical and dental students at recognized medical and dental schools, and interns and resident physicians, surgeons and dentists at recognized hospitals' shall be exempt from training and service but not from registration. Any such student, intern or resident, the bill continues, who is a member of a reserve component of the land or naval forces of the United States shall not be ordered or called to active duty or into active service in any such forces without his consent, except in time of war.

"Finally it is proposed that any person selected for training and service under the act (1) who has been awarded a degree of doctor of medicine or doctor of dental surgery by a recognized medical or dental school, (2) who holds a valid license to practice medicine or dentistry and is engaged in such practice at the time of his selection, and (3) whose physical and mental fitness for such service has been satisfactorily determined shall in lieu of induction for training in service be commissioned as an officer in the Medical Department Reserve, Officers' Reserve Corps, and ordered into active military service of the United States as provided in the joint resolution approved August 27, 1940, by which the President was authorized to call into active service members of the National Guard and Reserve components of the Army. Senator Murray's bill was referred to the Senate Committee on Military Affairs. A companion bill, H. R. 10587, is pending in the House Committee on Military Affairs. Until and unless these measures become law interns, medical students and residents should provide for local selective boards information and affidavits indicating their desire for exemption because of essential work for the public health."

A new and economical process for drying human blood plasma after it has been frozen, to preserve it for use as a substitute for whole blood in transfusion, is described in *The Journal of the American Medical Association* for September 28 by Earl W. Flosdorf, Ph.D., F. J. Stokes, M.A., and Stuart Mudd, M.D., Philadelphia, who emphasize its importance in time of war.

Plasma is the liquid portion of the blood before clotting. "In dry form resulting from desiccation (drying) from the frozen state," the authors say, "the plasma proteins may be maintained in highly stabilized form, without refrigeration except for long time reserve-storage, and are instantly available for use by dissolving in water to the original or to a more concentrated volume. War-time emergency increases the importance of ready availability of large reserves of this agent in the dry stabilized form."

The new process is more economical than earlier procedures for vacuum drying on the large scale required, the authors say.



# THE JOURNAL

of the

Missouri State Medical Association

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NOVEMBER, 1940

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## EDITORIALS

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### THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

### MEDICAL PREPAREDNESS

Have you returned your questionnaire to the Committee on Medical Preparedness of the American Medical Association? There have been 3,353 Missouri physicians or 63.6 per cent who have returned their questionnaires. It is absolutely necessary that a 100 per cent return be made for in the event of war the information compiled from the questionnaires will be used in filling the necessary medical personnel for military activities as well as for maintaining adequate medical service for the civilian population.

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### ANTITRUST TRIAL CREATES OBSTACLES FOR AMERICAN MEDICAL ASSOCIATION IN MEDICAL PREPAREDNESS

The following is an important official announcement which appeared in *The Journal of the American Medical Association* for October 19. It concerns the difficulties in the mobilization of the medical profession in connection with the selective service and the program of preparedness created by the Department of Justice case against the medical profession scheduled for trial on October 21. The editorial follows:

"At this time *The Journal* is compelled to inform its readers that the work of the American Medical Association as a body, including its contribution in aid of the national defense, must suffer serious interference during the next two or three months. The Secretary and General Manager of the American Medical Association, the Editor of its publications, the Secretary of its Council on Medical Education and Hospitals and the Director of its Bureau of Medical Economics must be absent from the headquarters office during those months since they are required to attend, as defendants, their trial in the United States District Court for the District of Columbia on the indictment there returned against them and against the American Medical Association, the Medical Society of the District of Columbia, the Washington Academy of Surgery, the Harris County (Texas) Medical Society and fifteen prominent physicians in Washington, D. C. The indictment charges all defendants with having conspired to violate Section 3 of the Sherman Anti-Trust Act. The Association respectfully asks the indulgence of the medical profession and the public throughout the United States for any deficiencies which may result from this unavoidable and unfortunate condition.

"When the American Medical Association was requested to assist in the national emergency now confronting this country, its House of Delegates voted unanimously and without dissent to give whole hearted cooperation and support. The officers, the headquarters office, the Committee on Medical Preparedness, the state chairmen and numerous other physicians have been and are now engaged intensively in that service, and they ex-

pect to continue therein. In advising physicians and the public of this apparent discouragement in the essential work that it has undertaken to perform, the Association desires to say that it will do its utmost to overcome all obstacles to medical preparedness. We assure the medical profession that it will never be said, either in criticism or in comment, that the Association failed its country in any hour of need no matter what obstacle might arise to interfere with the otherwise expeditious and efficient service that this country deserves in this critical hour.

"The Journal has indicated repeatedly the difficulties associated with medical mobilization and the nature of the work now being carried on to provide all the various arms of the government with physicians. Even though this work will be seriously hampered by absence from the headquarters office of some of the key men who have been charged with this duty, every possible method will be utilized to carry on the work as expeditiously as can be done. Plans are also being developed for the handling of correspondence, finance, personnel and all the other multitudinous affairs associated with the work of this great organization to the best extent of which the organization is capable, so that the medical world and the public may not suffer by this serious interference with the provision of medical service and the dissemination of knowledge of medical advancement."

#### MEDICAL INDUCTION BOARDS

As an aid to the Army Medical Department in securing physicians to serve as medical examiners at induction stations, the Committee on Medical Preparedness has requested that physicians who wish to volunteer for this service write at once to the Committee. Letters should be addressed to Dr. Robert Mueller, Committee on Medical Preparedness, 623 Missouri Building, St. Louis.

Physicians preferred for this service are those who, because either of age or physical infirmities or because of reasons affecting their civil life, cannot go into military camp. It has been estimated that the time required for this service might approximate twenty to thirty days in the period between October 16 and February 1.

An editorial in *The Journal of the American Medical Association* for October 19 outlines the activities of medical induction boards as follows: "At each of these induction stations there is to be a board of medical examiners who will be responsible for determining whether or not young men will be actually assigned to camps and cantonments for training. During mobilization the usual flow of men will be from local selective service boards to induction stations for final examination and induction, then to reception centers for classification and other processing, then to the organizations, installations or replacement centers in which they are to serve.

"The induction station serves the same purpose

as the recruiting station does in times of voluntary enlistment. Therefore recruiting stations, augmented as required, will be used as induction stations. Corps area commanders are authorized to establish induction stations at any point in their areas. It has been estimated that from nine to twelve induction stations for each corps area will be sufficient, including at least one in every state, which would make about one hundred in all. In sparsely settled areas the induction station may consist of a number of physicians and army officers who will travel from place to place.

"In each of these inductions there will be provided ample space, light and toilet facilities. During cold weather the rooms will be heated so that the young men who will be compelled to be nude during the examination will not suffer from cold. Special rooms will be provided for conducting eye, ear, nose and throat examinations, and there must be a room with a sink and toilet facilities for use as a laboratory. Corps area commanders are also expected to furnish necessary equipment where that is not available.

"For the physical examination the procedure contemplates an eight hour day with twenty-five men examined every hour. It is believed that it will be found practicable to admit one man to the examining team every two minutes. This will permit ten minutes at the end of each hour for further examination and conferences on difficult cases. The order of the examination is as follows:

"1. Laboratory examination of the urine and, when required, of sputum, blood smears and urethral discharges.

"2. Withdrawal of blood for the serologic test for syphilis. Blood specimen will be obtained and subsequently tested in federal or state laboratories by personnel assigned by the United States Public Health Service.

"3. Eye, ear, nose, throat and dental examinations. Registrants may remain clothed up to this point if desirable. From here on they must be completely nude.

"4. Height, weight and chest measurements and examination of the bones, joints and feet. This may be done in one large or two small rooms. The room for the orthopedic examiner should be of sufficient size so that four examinees may be brought in at one time and put through the required movements.

"5. General surgical examination.

"6. Examination of heart and lungs, for which three rooms will be required, so situated that examiners will not be disturbed by outside noises.

"7. Neuropsychiatric examination.

"8. Checking of records by the chief of the examining board. At this time requests for X-ray, laboratory and other special examinations will be prepared and provision made when necessary for the examinee to be conducted to the proper army hospital or civilian institution for the examination. Arrangements for a local hospital or clinic to provide these facilities must be made by the chief of



the board prior to beginning the examinations. In occasional instances proctoscopic, electrocardiographic and other special examinations may be required.

"As explained by Col. Albert G. Love in *The Journal*, October 5, the specialists to be assigned to such service will probably include civilian specialists as well as reserve officers, who will be on temporary duty. Civilian physicians will be on a per diem basis and will be used as long as their services are required. It has been proposed that they be paid at the base pay of major with allowances for travel and subsistence while on duty."

### WASHINGTON UNIVERSITY MEDICAL CENTER

The Medical Center comprising the Washington University School of Medicine and affiliated hospitals is celebrating the quarter centennial of its existence this year. In 1915 the new structures for laboratories and hospitals at 600 South Kingshighway, St. Louis, were dedicated.

Medical teaching west of the Mississippi River began in St. Louis early in the nineteenth century. It was initiated by two schools, the Kemper College Medical Department established in 1840 and the St. Louis University Medical Department organized in 1842. Kemper College Medical Department, sometimes called after its founder, McDowell, became allied with the University of Missouri and later became an independent school known as the Missouri Medical College. The St. Louis University Medical Department, founded by Pope, became an independent school in 1855 and was chartered as the St. Louis Medical College. In 1891 it became Washington University School of Medicine which in 1899 absorbed the Missouri Medical College.

A survey of medical schools made by the American Medical Association and a report by Abraham Flexner for the Carnegie Foundation prompted Robert S. Brookings, president of the corporation, to strengthen the medical school. Following reorganization of the school in 1910, arrangements were made for the establishment of the Barnes Hospital and an affiliation was formed with the trustees of the St. Louis Children's Hospital. Both hospitals were to be staffed by teachers of the medical school. The present site of the hospitals and school was purchased and in the fall of 1914 the school was moved into the new laboratories and hospital. When dedication was made in April 1915, the group consisted of the School of Medicine, Barnes and the Children's hospitals.

In 1916 three clinical departments were established by endowments from individuals and the General Education Board: the John T. Milliken Department of Medicine, the Mary Culver Department of Surgery and the Edward Mallinckrodt Department of Pediatrics. In the same year the nurses' residence and a dormitory for medical students were

built and the Department of Medical Social Service was organized.

The staff, medical students and nurses were active in the World War and in 1918 a class of medical students received their diplomas at Rouen, France.

The Department of Pharmacology was endowed in 1919. In 1927 the St. Louis Maternity Hospital erected a new building on ground provided by the University to be staffed by the Department of Obstetrics which was then newly endowed. The School of Dentistry located directly opposite the School of Medicine was opened in 1928.

In 1931 the McMillan Hospital, the Oscar Johnson Institute and the Mallinckrodt Radiological Institute were erected and the Rand-Johnson Surgical Wing of Barnes Hospital was opened. In the same year, the Dispensary, now the University Clinics, was reorganized. The Department of Neuropsychiatry was established in 1938.

During the first quarter century of operation 1,791 medical students have been graduated from the Medical School; 625 young graduates have been trained as house officers in the hospitals and 810 student nurses have been graduated from the School of Nursing. There are 2,545 living graduates of the School of Medicine and of the schools which formed the School.

### NEWS NOTES

Dr. Howard B. Goodrich, Hannibal, has been appointed a member of the State Board of Health to fill the unexpired term of Dr. M. B. Clopton, St. Louis, resigned. The term expires April 18, 1941.

Dr. F. C. Helwig, Kansas City, was a guest of the Tulsa County (Oklahoma) Medical Society at Tulsa on September 23 and spoke on "Clinical and Experimental Studies of Coronary Diseases With Special Emphasis on Trauma."

Dr. A. Graham Asher, Kansas City, was awarded first prize for his scientific exhibit on "Tests for Cardiac Function" at the meeting of the Mississippi Valley Medical Society at Rock Island, Illinois, September 25 to 27. Dr. F. Stanley Morest, Kansas City, received a certificate of merit for an essay on "Hypothyroidism."

Paul B. Hoeber, Inc., Medical Publishers, 49 East 33rd Street, New York, requests that members be informed that Mr. C. W. Myers no longer represents the company and has no authority to collect money or sell for the company. Any physician receiving a visit from Mr. Myers is requested to notify the company by telegram collect.

Dr. C. E. Burford, St. Louis, President of the Association, was a guest of the Southeast Missouri

Medical Association at Poplar Bluff at its sixty-fourth annual meeting on October 1 and 2. He spoke at a banquet meeting and at a scientific session. Other guest speakers were Drs. Lawrence D. Thompson and Duff S. Allen, St. Louis.

Drs. E. Lee Dorsett and Quitman U. Newell, St. Louis, presented addresses at the meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons at Excelsior Springs, September 26. Dr. Dorsett spoke on "Reoperation, Analysis of One Hundred Twenty-Five Cases," and Dr. Newell spoke on "Transmigration of the Human Ovum."

The Civil Service Commission announces that there is an urgent need for medical officers and senior and associate medical officers to fill permanent positions in other agencies than the United States Army. Sufficient applications have been received to meet the prospective need for temporary and part time civilian medical officers in connection with the Army expansion. Receipt of applications for this branch closed October 14. Applications will be received until further notice for positions in other agencies paying from \$3,200 to \$4,600 a year. Fourteen specialized branches of medicine are included. There is also an urgent need to fill junior medical officer positions at \$2,000 a year at St. Elizabeths Hospital, Washington, D. C. Full information and application forms for these examinations may be obtained at the Board of United States Civil Service Examiners and post offices or from the United States Civil Service Commission, Washington, D. C.

Dr. M. Pinson Neal, Columbia, was awarded the Mississippi Valley Medical Society's Distinguished Service Award for 1940 at the annual banquet of the society held at Rock Island, Illinois, September 26. The award is given annually for "unusual and distinguished service to the medical profession." The citation with the award to Dr. Neal was "A recognition of splendid teaching, conscientious and valuable research together with sterling character." Dr. Neal is professor of pathology at the University of Missouri where he has been since 1922. Previously he had been at the Von Ruck Research Laboratory for Tuberculosis at Asheville, North Carolina, Northwestern University School of Medicine and the State University of Iowa College of Medicine. He is a former Chairman of the Council of the Missouri State Medical Association and was elected Speaker of the House of Delegates at the Joplin Session. While serving as a Major in the Medical Corps of the United States Army during the World War, Dr. Neal was awarded a citation by General John J. Pershing for conspicuous and meritorious service with troops in France.

"Doctors at Work" is the title of the sixth annual series of dramatized radio programs to be presented

by the American Medical Association and the National Broadcasting Company. The series will open Wednesday, November 13, and will run for thirty consecutive weeks closing with a broadcast from the American Medical Association meeting in Cleveland on June 3, 1941. The program is scheduled for 9:30 p. m. Central Standard Time over the Blue network and other National Broadcasting Company stations. The programs will dramatize the opportunities offered the individual by modern medicine for better health and more successful treatment of disease and explain the characteristics of the different fields of modern medicine and its specialties. The Bureau of Health Education of the American Medical Association under the directorship of Dr. W. W. Bauer will have supervision of the broadcasts. The script will be written by Mr. William J. Murphy who has written many previous similar features and will be produced under the direction of Mr. J. Clinton Stanley who directed "Medicine in the News," last season's successful health program presented by the American Medical Association and the National Broadcasting Company.

The clinical pathological conferences at the Ellis Fischel State Cancer Hospital, Columbia, will be held the third Tuesday in each month at 7:00 p. m. instead of Thursday as was originally announced.

## DEATHS

**Sheets, Robert C., M.D.,** Orrick, graduate of the St. Louis College of Physicians and Surgeons, 1890; Fellow of the American Medical Association; member of the Ray County Medical Society; aged 73; died May 25.

**Hunker, Lewis, M.D.,** St. Louis, graduate of Washington University School of Medicine, 1903; honor member of the Randolph-Monroe County Medical Society; not in practice; aged 62; died June 26.

**Hope, Daniel H., M.D.,** Cape Girardeau, graduate of Washington University School of Medicine, 1904; Fellow of the American Medical Association; member of the Cape Girardeau County Medical Society; delegate to Annual Sessions; president of Cape Girardeau County Medical Society in 1938; aged 61; died July 4.

**Smith, Rollin John, M.D.,** Appleton City, graduate of the Missouri Medical College, 1887; honor member of the Henry County Medical Society; retired; aged 79; died July 20.

**Tilt, John C., M.D.,** St. Joseph, graduate of St. Louis University School of Medicine, 1903; honor member of the Buchanan County Medical Society; aged 71; died July 30.

**Hein, Emil Edgar, M.D.,** St. Louis, graduate of St. Louis University School of Medicine, 1914; honor member of the St. Louis Medical Society; not in practice; aged 49; died August 31.

**Baker, Henry A., M.D.,** Kansas City, graduate of University of California Medical School, 1891; honor member of Jackson County Medical Society; aged 70; died September 17.

**Tyler, Richard S., M.D.,** Sweet Springs, graduate of Washington University School of Medicine, 1879; honor member of Pettis County Medical Society; aged 85; died September 22.



## COUNCILOR DISTRICT AND SOCIETY PROCEEDINGS

### COUNTY SOCIETY HONOR ROLL 1940

(SOCIETIES WHICH HAVE PAID DUES FOR ALL MEMBERS AND DATE PLACED ON HONOR ROLL)

#### HONOR ROLL

Chariton County, December 5, 1939.  
Perry County, December 11, 1939.  
Camden County, December 18, 1939.  
Miller County, December 20, 1939.  
Ste. Genevieve County, December 22, 1939.  
Clinton County, December 23, 1939.  
Moniteau County, January 8, 1940.  
Macon County, January 10, 1940.  
Dent County, January 29, 1940.  
Dallas-Hickory-Polk Counties, February 15, 1940.  
Barry County, February 22, 1940.  
Audrain County, March 22, 1940.  
Webster County, March 25, 1940.  
Morgan County, April 8, 1940.  
DeKalb County, April 15, 1940.  
Newton County, April 15, 1940.  
Howard County, April 16, 1940.  
Lincoln County, April 26, 1940.  
St. Francois-Iron-Madison-Washington-Reynolds Counties, May 2, 1940.  
Adair-Schuyler-Knox-Sullivan-Putnam Counties, May 16, 1940.  
Bates County, May 24, 1940.  
Benton County, July 6, 1940.  
Holt County, July 8, 1940.  
Pulaski County, July 8, 1940.  
Franklin County, July 9, 1940.  
Phelps-Crawford Counties, July 12, 1940.  
Carroll County, July 18, 1940.  
Christian County, July 19, 1940.  
Carter-Shannon Counties, September 3, 1940.  
Mercer County, September 27, 1940.  
Henry County, September 28, 1940.  
Pettis County, October 10, 1940.

#### ASSOCIATE EDITORS: COUNCILORS OF THE TEN COUNCILOR DISTRICTS

##### FIRST COUNCILOR DISTRICT

A. S. BRISTOW, PRINCETON, COUNCILOR

##### Carroll County Medical Society

The Carroll County Medical Society met at the County Courthouse in Carrollton at 1:30 p. m., August 13, with Dr. C. S. Austin, Carrollton, presiding.

Dr. James R. Amos, Higginsville, District Health Officer, spoke on the public health arrangement in Missouri. This was followed by a round table discussion.

The Society voted to endorse the proposed measure on prenatal blood tests for the improvement of infant and maternal health.

Those present were Drs. W. G. Atwood, C. S. Austin,

E. L. Bales, R. M. Benson, J. M. Platz, Lynn Samuels and R. H. Staton, Carrollton; W. P. Kemp and J. H. Robertson, Hale; B. C. Cole, Norborne.

The Society will meet on the second Tuesday of each month.

JOHN H. PLATZ, M.D., Secretary.

##### FIFTH COUNCILOR DISTRICT

W. A. BLOOM, FAYETTE, COUNCILOR

##### Cooper County Medical Society

The Cooper County Medical Society met at St. Joseph's Hospital, Boonville, at 7:30 p. m., October 10, with the following present: Drs. G. L. Chamberlain, New Franklin, president; W. E. Stone, T. C. Beckett, G. W. Winn, W. H. Ziegler, Arie C. H. Van Ravenswaay, J. C. Tincher, G. W. Blankenship and H. D. Quigg, Boonville. Drs. Henry H. Sweets and H. E. Allen, Columbia, were guests.

Physical examination of draftees by the local board was discussed.

Dr. G. W. Blankenship, Boonville, was elected a member.

A proposal was received to consider a joint meeting with the Howard County Medical Society at an early date.

Plans were made for a dinner in honor of Dr. W. E. Stone, Boonville, who will leave in November for a year of duty with the 128th Field Artillery.

Dr. Henry H. Sweets, Columbia, discussed "Primary Carcinoma of the Kidney With Multiple Subcutaneous Metastases" and demonstrated gross and microscopic material.

J. C. TINCHER, M.D., Secretary.

##### EIGHTH COUNCILOR DISTRICT

H. L. KERR, CRANE, COUNCILOR

##### Jasper County Medical Society

The Jasper County Medical Society held the first meeting of the fall at Joplin on October 8. The new officers of the Society are: President, Dr. Roy E. Myers, Joplin; vice president, Dr. R. W. Webster, Carthage; secretary, Dr. Sam. A. Grantham, Joplin; treasurer, Dr. H. D. McGaughey, Joplin; editor of the *Caduceus*, Dr. Irwin T. Craig, Joplin.

Dr. Irwin T. Craig, Joplin, read a paper on "Retrospection of the Uterus" which was followed by discussion.

It was decided to have one or more guest speakers at the monthly dinner meetings and have members speak at the regular business meetings.

It was announced that Dr. U. J. Busiek, Springfield, would discuss "Poliomyelitis" and Dr. Fred R. Farthing, Springfield, would speak on "Uterine Bleeding" at the meeting on October 22.

SAMUEL A. GRANTHAM, M.D., Secretary.

##### NINTH COUNCILOR DISTRICT

ELDON C. BOHRER, WEST PLAINS, COUNCILOR

##### South Central Counties Medical Society

The South Central Counties Medical Society met at the Horton Hotel, Willow Springs, at 6:00 p. m., September 12.

Members present were Drs. A. C. Ames, H. G. Frame, R. W. Denney and R. A. Ryan, Mountain Grove; Garrett Hogg, Cabool; J. A. Fuson, Mansfield; J. R. Mott, Hartsville; R. M. Norman, Ava; L. M. Dillman, Houston; C. F. Callihan, Willow Springs.

The Society voted to approve the prenatal blood test bill.

The president, Dr. R. M. Norman, Ava, appointed a committee to advise the county nurse in Texas County. The committee consisted of Drs. L. M. Dillman, Houston, chairman; Garrett Hogg, Cabool, and Leslie C. Randall, Licking.

The next meeting will be held in Cabool on October 10.

C. F. CALLIHAN, M.D., Secretary.

#### TENTH COUNCILOR DISTRICT

ELAM J. NIENSTEDT, SIKESTON, COUNCILOR

##### Cape Girardeau County Medical Society

The Cape Girardeau County Medical Society was guest of the Midwest Dairy Products Company, Cape Girardeau, on October 14. Members were shown through the plant which has undergone considerable reconstruction and is being further modernized and approved the evident serious intention of the company to provide the public with good food products.

After the inspection a chicken dinner was served at the Colonial Tavern with the dairy company as host.

Members attending the meeting were Drs. C. T. Herbert, Cape Girardeau, president; W. F. Oehler, M. H. Shelby, F. W. Hall, O. L. Seabaugh, J. H. Cochran, D. B. Elrod, G. J. Tygett and C. A. W. Zimmermann, Cape Girardeau; D. I. L. Seabaugh, Jackson, and Edward Crites, Sedgewickville.

A representative of the State Board of Health asked the attitude of the Society toward his confining to jail syphilitic patients who refused to return for treatment. The Society decided that this was a matter for the Board to decide.

A letter from Dr. Robert Bartlett, St. Louis, offering to present a paper on diseases of the thyroid gland was referred to the program committee.

An acknowledgment of congratulations for Father Alphonse M. Schwitalla, St. Louis, on his silver jubilee was read.

The secretary asked instructions on his position relative to subject matter which is to be considered by the Committee on Medical Economics of the Association at an early meeting.

C. A. W. ZIMMERMANN, M.D., Secretary.

##### St. Francois-Iron-Madison-Washington-Reynolds County Medical Society

The St. Francois-Iron-Madison-Washington-Reynolds County Medical Society met at the St. Francois County Courthouse, Farmington, September 27 at 7:30 p. m.

Dr. John H. Hershey, St. Louis, spoke on "Surgical Symptoms of the Abdomen." He discussed the function of the abdominal contents, making the cause for the symptoms clear. A lengthy, interesting discussion followed.

The Farm Security Administration was discussed and the Society went on record as not recommending it to its members.

A letter of transfer for Dr. H. J. Frieheit, Fredericktown, to the Madison County (Illinois) Medical Society was given.

G. TIVIS GRAVES, M.D., Secretary.

"The incidence of all types of reactions was no greater from the transfusions of preserved blood than when fresh blood was employed, provided proper care was taken in storing and handling it," Elmer L. DeGowin, M.D., and Robert C. Hardin, M.D., Iowa City, report in *The Journal of the American Medical Association* for September 14. Their findings are based on a study of the results of 295 fresh blood and 2,128 stored blood transfusions.

## CORRESPONDENCE

### RURAL REHABILITATION

United States Department of Agriculture  
Farm Security Administration

Boone Building, Columbia, Mo.

August 22, 1940

To the Editor:

In these days of concern over the critical situation in Europe, it is easy for us to forget that we have many problems at home. It is easy to forget that our American farmers still are faced with many obstacles; that the European war may make these problems even more difficult unless we continue our efforts toward finding a solution.

For that reason, I take this occasion to report to you the progress being made and the problems being encountered by the Farm Security Administration in its assigned task of assisting farm families in the low income brackets to attain adequate living standards and permanent security.

The following table gives some of the high points of progress made during 1939 by 18,951 Missouri farm families cooperating with the Farm Security Administration in its Standard Rural Rehabilitation program. We wish to call your attention, particularly, to net income and net worth gains shown in the financial progress section. We also place great value upon the progress in production of goods for home consumption.

	Year Before Joining FSA (Per family)	During 1939	Per Cent Gain
Net Income	\$342	\$534	56
Net Worth	628	893	42
Goods Produced for Home Use	117	216	84

Improved landlord-tenant relationships and greater security of tenure were reflected by the fact that 9,690 tenants in the FSA program operated under written leases in 1939. There were 368 loans amounting to \$2,430,563 made to Missouri farm tenant families up to June 20, 1940, for the purchase of family sized farms. By May 31, 1940, Missouri farm families had borrowed \$16,047,274 under the FSA Rural Rehabilitation program and had repaid \$4,307,455.

While this report is concerned mainly with progress these families have made toward solution of their problems, one is faced constantly with the realization that many problems remain unsolved. One of the most acute situations today is the shortage of land available to tenants. A recent survey shows that 619 of the families who operated under the FSA program in Missouri in 1939 have not been able to find farms to operate in 1940. Furthermore, an additional 1,690 otherwise eligible farm families were not made loans because they could not find land to rent. Further still, after consulting with county agricultural agents and other informed persons, our supervisors estimate that another 4,863 Missouri farm tenants outside the FSA program have been unable to rent farms in 1940.

Another problem which recurs frequently is that of increasing rentals for many of our families. This increase comes as a result of the work these families have done in cleaning up the farms they operate and in putting into practice good methods which make the farms more attractive.

As the data given indicates, progress is being made toward solution of these problems. However, the enormity of the job is impressed upon us by the fact that there still were 29,757 Missouri farm families this spring who are in the so-called lower economic third and who need the assistance and guidance we have to offer.

I am sending you this report because I believe that you are interested in the welfare of Missouri farmers and because we need your assistance as a citizen in so-



lution of the problems with which these people are struggling.

It is my firm belief that the people themselves will find solutions to their problems if they are given an opportunity. They will find the solutions when they become fully aware of the extent to which these problems affect the opportunities for their children, their health, their security and the many other factors which touch their daily lives. The Farm Security Administration can furnish credit and technical guidance; but only on the foundation of clear thinking by all of the citizens of each community can the final solutions be determined and placed in operation.

Very truly yours,  
STEPHEN C. HUGHES, State Director,  
Farm Security Administration.

## BOOKS FOR LEISURE MOMENTS

### DOCTOR VISITS ARABIA

Rosalie Slaughter Morton describes "A Doctor's Holiday in Iram" (Funk and Wagnalls, New York) in her second book. It is not distinguishable from the ordinary travel book and is not possessed of that vivid literary spirit which made her "A Woman Surgeon" such delightful reading.

B. Y. G.

### DID THE HAND OF THE POTTER SHAKE

With this foreword from Omar Khayyam, the English psychiatrist, Clifford Allen, considers "The Sexual Perversions and Abnormalities" (Oxford University Press, London). To determine the natural development of the sexual reflexes Allen examined the growth of the sub-human primates. He observed the uninhibited development of sexual curiosity and play as well as the variety of perversions which have been an unending source of concern to psychiatrists and law makers. He is by no means didactic in his application of these observations to the human being. Rather he believes that such asocial or unsocial behavior as may be manifested derives from an impairment of the opportunity for normal development. The volume is rich in its connotations of natural and unrestricted development. It should prove immensely useful to the professional person dealing with the field or having charge of the development of youth.

B. Y. G.

## BOOK REVIEWS

**SPECIALTIES IN MEDICAL PRACTICE.** By Edgar Van Nuys Allen, M.D., Editor, Chief of a Section in the Division of Medicine, the Mayo Clinic, Rochester Minnesota; etc., with a Foreword by Donald C. Balfour, M.D., F.A.C.S., F.R.C.S., (England), F.R.A.C.S., Consultant in Surgery, The Mayo Clinic, etc. Volumes I and II. New York and Edinburgh: Thomas Nelson and Sons. 1940.

These loose-leaf volumes of specialties in medical practice have thirteen contributors covering the fields of ophthalmology, diseases of the ear, nose and throat, neurology, psychiatry, the vitamins and vitamin deficiency diseases, allergy, orthopedic surgery, obstetrics and gynecology, endocrinology, urology, proctology, dermatology and syphilology. The majority of these subjects have from one hundred to two hundred pages devoted to fundamental knowledge and practical application. The sections are virtually abstracts of textbooks and form an up-to-date library. The purpose of these volumes is to put into the hands of the general practitioner

the basic information of the specialties discussed so he can cover several fields of new knowledge with minimum time and effort. Further, specialists will find this work valuable for reference to gain knowledge of other specialties so necessary for correlation to obtain a broader viewpoint in a limited field.

The section on ophthalmology is subdivided into ocular therapeutics, swelling of the eyelids, foreign body sensation, crusted lids, tearing, discharge from the eyes, injuries of the eye, double vision, vertigo, spots before the eyes, headaches, gradual loss of vision, sudden loss of vision, glaucoma, protruding eyes, sunken eyes, cross eyes, nystagmus, red eyes and cloudiness of the cornea.

The chapter on allergy is developed under the headings of characteristics of all types of allergy, classification of the phenomena of allergy, the problem of the origin and development of clinical allergy, the mechanism of allergic reactions, allergens, skin tests in allergic patients, seasonal allergic rhinitis, allergic conjunctivitis, bronchial asthma, allergic eczema, drug allergy, urticaria and angioneurotic edema serum sickness and allergic shock and gastrointestinal allergy. Each of the other sections are just as thorough in covering their specialties.

In concluding the reviewer wishes to emphasize that here is the place to get the needed information on "What is wrong with my patient?" and "How shall I treat my patient?" without going through a mass of detail about unknown etiology or cumbersome theories on physiology or pathology such as fill most textbooks.

F. S. M.

**A MANUAL OF OTOTOLOGY, RHINOLOGY AND LARYNGOLOGY.** By Howard Charles Ballenger, M.D., F.A.C.S., Assistant Professor of Otolaryngology, Northwestern University School of Medicine, Chicago, Illinois. Illustrated with 90 engravings and four color plates. Philadelphia: Lea & Febiger. 1940. Price \$3.75.

This work meets a need, expressed by the author, for "a small concise textbook on diseases of the nose, throat and ear which would emphasize anatomy, etiology, symptoms and diagnosis." This is what Dr. Ballenger has done. The book is divided into the customary parts, the nose and accessory sinuses, the pharynx and fauces, the larynx and the ear including the mastoid. Each part begins with a clearly written chapter on clinical anatomy and physiology. Other chapters are full of condensed practical material on etiology, pathology, symptoms and diagnosis written in an orderly and readable fashion.

The book is especially useful to the general practitioner located in an area noted for considerable work in this specialty and is also of value to the beginner in this field. Treatment except for major operative technique is given, this being left to more comprehensive treatises.

H. H. B.

**ELMER AND ROSE PHYSICAL DIAGNOSIS.** Revised by Harry Walker, M.D., F.A.C.P., Associate Professor of Medicine, Medical College of Virginia, Richmond, Va. With 295 Illustrations. Eighth Edition. St. Louis: The C. V. Mosby Company. 1940. Price \$8.75.

Elmer and Rose, "Physical Diagnosis," Eighth edition, 1940, revised by Dr. Harry Walker, Richmond, Virginia, is a worthy successor of the editions which have preceded it. Written especially for medical students, the authors describe history taking and the physical examination of the patient in great detail, evaluating the significance of each sign and in many instances correlating it with the roentgen ray film or postmortem findings. The authors state in the preface to this edition that "now more than ever before we know the relative value of physical findings."

In addition to the purely physical findings, the book

contains an excellent chapter on electrocardiography and the arrhythmias written by Dr. Drew Luten, St. Louis. Dr. James Asa Shield contributed a chapter on the neuropsychiatric examination of patients, and Dr. Porter P. Vinson an all too brief chapter on bronchoscopy, esophagoscopy and gastroscopy.

The book is printed on white paper which has a greenish tinge; the print is large and exceptionally clear and the many illustrations are excellent. It has been brought thoroughly up to date and is easily one of the best books on physical diagnosis in the English language.

L. H. H.

**MODERN MEDICAL THERAPY IN GENERAL PRACTICE.** Edited by David Preswick Barr, A.B., M.D., LL.D., Busch Professor of Medicine, Washington University; Physician-in-Chief, Barnes Hospital, St. Louis. Volumes I, II and III. General Therapy, Methods Used in Therapy, General Diseases. Baltimore: The Williams & Wilkins Company. 1940.

This is an excellent encyclopedia on modern therapy. Bibliographies are excellent and it would be well for each practicing physician to have the volumes for reference.

W. G. B.

**APPLIED PHARMACOLOGY.** By Hugh Alister McGuigan, Ph.D., M.D., F.A.C.P., Professor of Pharmacology and Therapeutics, University of Illinois, College of Medicine. Illustrated. St. Louis: The C. V. Mosby Company. 1940. Price \$9.00.

This textbook emphasizes the practical application of the science of pharmacology to clinical therapeutics. Pharmacology is based on the sciences of physiology, biological chemistry, histology and anatomy and is the outstanding liaison subject between these sciences and clinical therapeutics.

The book presents a large amount of information in a concise and interesting way. It contains many good illustrations and interesting quotations. Following an introduction of general drug actions and elementary composition of the body, the applied pharmacology of the various systems such as integumentary, respiratory, alimentary and circulatory is presented logically. Discussion of the newer therapeutic agents such as sulfanilamide and its compounds, vitamins, histaminase, arsenoxide, benzedrine, dilantin sodium, histidine and others is quite adequate. It is an interesting and informative book.

L. B.

**THE ART OF ANAESTHESIA.** By Paluel J. Flagg, M.D., Visiting Anaesthetist to Manhattan Eye and Ear Hospital; Chairman of the Committee on Asphyxia of the American Medical Association, etc. Sixth edition, revised. 161 Illustrations. Philadelphia, London, Montreal: J. B. Lippincott Company. 1939.

This sixth edition is a thorough, well written revision of an old established textbook. Dr. Flagg started writing his first edition during the World War, and the fact that this publication has reached the sixth edition proves its acceptability.

The author stresses the importance of the understanding of the groundwork of anesthesia, physics and physiology, chemistry and pharmacology, and the interpretation of the signs of the patient's condition; he further suggests study and interest in cardiology.

This edition's chapter on basal anesthesia has been improved and enlarged to include the latest views on the commonly employed hypnotics. Another improvement is the material added to enable the anesthetists to correlate his pre-anesthetic findings and to aid him in the detailed consideration of the causes of death in anesthesia.

Helium therapy, cyclopropane and carbon dioxide absorption technic and divinyl ether have influenced him to add to his fifth edition. The author has but little enthusiasm for the widespread use of cyclopropane.

Dr. Flagg has increased his discussion of the endotracheal technic, the art of laryngoscopy and intubation because of their general and recent popularity. He classifies the stages of asphyxia and mentions the value of this knowledge in obstetrics all in the manner of one familiar with its problems.

Special reference is made to anesthetic methods for brain and thoracic surgery and to recent advances in oral surgery, made possible by refinements in anesthetic agents and technic.

Dr. Flagg makes a plea for the anesthetist to interest himself in local and regional anesthesia and to manifest proficiency in the use of gases in emergency resuscitation; and, further, to treat clinical diseases such as pneumonia, asthma and intestinal obstruction. In short he expects anesthetists to be expert pneumatologists.

This book is an up to date contribution, comprehensive and instructive and an excellent exposition of the art of anesthesia.

R. M. S. B.

#### LEGITIMATE USES OF MARIHUANA ADD TO PROBLEM OF ITS CONTROL

The control of the highly dangerous use of marihuana as a drug is made difficult by the fact that there is a large variety of legitimate industrial uses for this plant, S. R. Winters, Washington, D. C., points out in the October issue of *Hygeia, The Health Magazine*.

The fibers of the plant, which is often referred to as hemp, are used legitimately by industries to manufacture rope, twines, hats and paper. "The plant's long fibers are also used to make textiles and plastics," the author says, "but when the stalk is cut before the plant reaches maturity, little or no resin, from which the narcotic substance is made, has been able to develop. The seeds of the plant are used for bird foods; the oils obtained from the seeds are used in the preparation of pharmaceutical emulsions, paints, varnishes, soap and linoleum. The residue of the hempseed, after pressing, is used for both a livestock feed and a fertilizer.

"The variable potency and unpredictable effects of marihuana seriously limit its use for medical purposes, and physicians are generally agreed that it has no value in treatment which cannot be better replaced by other, more reliable drugs; its use as a relief for neuralgia and as an aid in psychoanalysis is questionable."

While the abuse of marihuana by young people is probably not as prevalent as many accounts would indicate, the peculiar susceptibility of adolescents to the practice of smoking cigarets and the relatively low price of marihuana make this drug a menace to youth. Statistics show that most devotees are found in age groups under 30 and that they have begun the habit by smoking.

"According to Moreau de Tours (1845)," Mr. Winters reports, "some of the psychic reactions of marihuana are: intellectual excitement, dissociation of ideas; over-excitation and exaggeration of sensations; errors in judging time and space; fixation of ideas having suggestive origin in the outside world; emotional disturbances during which the addict loses self control and may commit acts of violence; irresistible impulses, always of a suggestive origin, which may lead to suicide, and numerous illusions and hallucinations.

"The habit of drugs and crime go hand in hand. Prolonged use of large quantities of marihuana by habitues or a single large dose taken by the novice may cause criminally maniacal acts. Marihuana, frequently used by criminals to bolster courage, creates time and space illusions and destroys judgment of speed and distance."



# THE JOURNAL

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### THE IMPORTANCE OF WATER BALANCE AND THE ELECTROLYTES IN THE PRE- OPERATIVE AND POSTOPERATIVE CARE OF SURGICAL CASES

GEORGE W. POST, M.D.

CHICAGO

Thirty years ago it was the common teaching that the administration of fluids to febrile cases was a proper procedure in that it increased the dilution of the toxic products and facilitated their removal by the kidneys. I recall clearly hearing my father, who was a general practitioner, say that he never expected to lose a case of typhoid fever which he saw before serious complications had arisen or before the patient was in extremis, and with but few exceptions this was true. This was said at a time when typhoid was rampant about Chicago and the morbidity and mortality were exceedingly high.

At that time it was his practice to have the patient drink a sufficient amount of water to induce him to pass at least 2,000 cc. of urine daily. He had no exact criterion upon which to base such a rule, but after much experience he concluded that the patients did much better if they passed that quantity of urine and arbitrarily set that as a goal in the treatment of such cases. After seeing how well this worked in typhoid, he widened the practice to the treatment of all acute exanthemata and to all infectious processes with high fever. If the patient was unable to drink sufficient water to accomplish this, he would use the continuous enema or even give physiological saline solution by hypodermoclysis, and his results were far more satisfactory than those of the average practitioner. It is known now that with a few exceptions and with some modification of details this practice is thoroughly rational.

Perhaps this does not seem to be so remarkable but one must remember that at that time the prac-

tice of keeping the water intake as low as possible in certain diseases such as typhoid was also still popular and he encountered much criticism, well intended of course but misunderstood. He lived, however, to see himself fully vindicated in that particular.

At that time nothing was said about water balance but that procedure was, in fact, a means of preserving it in infectious cases, and although at present perhaps a slightly lower figure of urinary excretion is used, the idea is now common practice and the accepted practice.

At the time to which I refer, little was known if anything about electrolytes, pH radicals and the introduction of glucose. Something was known about Ringer's solution but it was used chiefly as a fluid ideal for the purpose of performing some experiments in the physiological laboratory.

In the preparation and after-care of surgical cases in that era the treatment was cruel, to say the least, and utterly irrational.

It was common practice to give the prospective surgical case a brisk laxative such as an ounce of oleum ricini the night before operation and an enema shortly before that procedure. After operation the patient was often deprived of water and food for from twenty-four to forty-eight hours, particularly if any operation involving the gastrointestinal tube had been performed. The fact that patients did as well as they did speaks well for their endurance and demonstrates the enormous reserves in water and electrolytes which the human organism possesses.

Then for some years one heard much about the routine administration of normal saline solution under the skin and by rectum, but almost never intravenously. Also, many men gave tap water enemas or saline solution by rectum by the continuous drip method and in the desperate cases transfusion of blood might be resorted to.

These things were done largely empirically at first just because the patients so treated seemed to recover better and more promptly, but with little if any understanding of water balance as such, or of the electrolytes and their significance, or of the

Presented at the 83rd Annual Session of the Missouri State Medical Association, Joplin, April 29, 30, May 1, 1940.  
From the Department of Surgery, University of Illinois College of Medicine, Chicago.

value of glucose or of the effects which lowered plasma protein had on the pH radical and the electrolytes in the blood.

As time went on, normal saline solution came to be used in cases of severe diarrhea and later in burns and it was disconcerting and difficult to understand why some of these cases would suddenly die, often in convulsions while copious amounts of normal saline solution were being administered.

However, since that time the terrific importance of blood biochemistry has been appreciated and a few facts are being learned about it, some of the most elemental parts of which are water balance and the electrolytes.

The whole blood volume equals about one eleventh and the plasma volume one twentieth of the body weight.

Water constitutes about 70 per cent of the body weight and the extracellular fluids about 20 per cent of it. The muscles contain about one half, the skin about one fifth and the blood one fourteenth of the body water.

There are two sources of body water under normal conditions: (1) by ingestion, and (2) by metabolism. The regulation of the circulating fluid is remarkable for its adaptability owing to the large amounts of water which can be stored as in the extravascular spaces and the spleen. It has been demonstrated that after an intravenous injection balance will again be reached within thirty minutes. However, a loss of from 20 to 25 per cent of the body water will be fatal.

The balance between intracellular and extracellular water depends upon the osmotic pressure within and without the cell membranes, the water being free to move between the two. The osmotic pressure of the intracellular water is largely due to potassium and that of the extracellular water is due to sodium.

It is characteristic that extracellular fluids contain large amounts of sodium, bicarbonate and chloride and small amounts of magnesium phosphate and potassium.

The intracellular fluid contains almost exclusively potassium and magnesium as basic ions and proteins and organic phosphate as acid ions. This relationship is maintained within close limits and variations in the intracellular water content depend largely upon the concentration of sodium in the extracellular fluid.

Losses of sodium chloride will lower osmotic pressure in the extracellular fluid and consequently, as the intracellular fluid loses no electrolyte, it attracts water from the extracellular fluids to reestablish osmotic equilibrium. The lowering of the level of the extracellular water produces symptoms of dehydration which promptly disappear upon the administration of normal saline solution, the readjustment taking place without increase in body weight.

The giving of water and dextrose alone will not

correct the dehydration unless the sodium chloride is given at the same time.<sup>1</sup>

There are three general causes of dehydration: (1) deprivation of fluids, (2) excessive loss of fluid, and (3) retention of quantities of electrolytes. The loss of chlorides can be made up by the retention of  $H_2CO_3$ , but the excreted basic ion (such as sodium, potassium, magnesium or calcium) can be replaced only from food.

The total concentration of electrolytes is dependent upon the stores of total base in the body.

In intestinal obstruction, fluid is poured into the gastrointestinal tract and, whether it be collected in loops of bowel or vomited, it depletes the blood chloride. This produces  $CO_2$  replacement and compensation leads to alkalosis which in turn produces base excretion in the urine with dehydration.

Pancreatic loss to the exterior leads to a depletion of base and reduction of plasma bicarbonate. In the adjustment of acid-base balance, excess acid is excreted by the kidneys entailing a loss of water.

The ingestion of acid producing salts causes base depletion which is used for neutralization and excretion of acid radicals, and these are therefore diuretics and dehydrating agents.

Dehydration causes: (1) loss of weight, fats and carbohydrates being drawn upon first; (2) disturbed acid-base balance toward the acid side with excessive production of acid metabolites, for instance, this with the retarded renal circulation reduces urinary excretion and acid (phosphoric) retention; (3) rise in blood nonprotein nitrogen; (4) rise in body temperature; (5) thirst, and (6) dryness, wrinkling and looseness of the skin.

Water intoxication produces lowered temperature, vomiting and convulsions, coma and death.

#### VARIATIONS IN BLOOD VOLUME

Reduction is brought about by (1) loss of whole blood, (2) reduction of red cells, (3) loss of plasma, (4) loss of water, and (5) posture. After thirty minutes in the erect position, the blood volume is 15 per cent less than in the lying posture. Pathologically, a reduction of blood volume occurs in hemorrhage, surgical shock, dehydration, pernicious anemia and other chronic anemias, obesity, chronic nephritis and myxedema.

Increase in blood volume occurs in high temperatures and after muscular exercise or muscular exertion. Pathologically it occurs in polycythemia vera, cirrhosis of the liver, leukemia, splenomegaly with anemia and by hyperthyroidism.

Loss of more than 30 per cent of the blood is usually fatal.

The immediate effects of the loss of less than 30 per cent of the blood volume are clotting, increase in the pulse rate, contraction of the spleen, increased respiration, reduced capillary bed and redistribution. Later there is replacement of fluid and of cells.



The lymph and tissue fluids which account for about 20 per cent of the body fluid or about 15 per cent of the body weight are, among other things, the great storehouse of extracellular water which makes possible the rapid restoration of balance when fluid is lost.

Increased flow of these fluids is produced by: (1) increased capillary pressure from venous obstruction which occurs rapidly, and by increased arterial pressure, but this occurs only after the pressure is 300 mm. Hg. or more; (2) increase in permeability of the capillary wall which is brought about by rise in temperature, capillary poisons such as peptone, histamine and foreign proteins and by reduced tissue oxygen supply; (3) hypertonic solutions in the form of hypertonic applications and dressings; (4) increased functional activity; (5) massage and passive movement.

Decreased flow of tissue fluid which results in edema, results from: (1) reduced osmotic pressure in the plasma which occurs where there is protein concentration; (2) changes in capillary blood pressure; (3) increased permeability of membrane; (4) obstruction of the lymph channels.<sup>2</sup>

Closely associated with the matter of water balance, there arises in this discussion the question of the regulation of the reaction of the body fluids. A full discussion of this topic can scarcely be encompassed within the limits of this paper but a consideration of some of the more or less elementary phases of this question is necessary.

It is necessary to think of the dissociation of the various electrolytic substances into their acid and basic ions which, when balanced against each other, determine the reaction of the body fluids. Some of these, when present in abnormal amounts, rapidly alkalize or acidulate the solution and if these alone were present quick and disastrous changes would occur. But some of these electrolytes, when present in a solution, tend to maintain it at a relatively constant pH when an acid or an alkali is added. Examples of these are  $\text{H}_2\text{CO}_3$ ,  $\text{NaHCO}_3$ ,  $\text{NaH}_2\text{PO}_4$  and  $\text{Na}_2\text{HPO}_4$ , and they are known as buffers.

Alkali reserve refers to the base bound as bicarbonate and the absolute quantity of bound  $\text{CO}_2$  in the plasma.

This group of interesting facts to which an unlimited number of additions might be made, lead to some bewilderment as to what the rationale of the whole matter is. Empirically, it has been found that the simple use of normal saline solution has been eminently satisfactory in a great majority of cases. With the addition of Ringer's and lactated Ringer's solutions, a considerably greater number of cases are well cared for. The use of blood transfusion still further completes the picture. Yet a fuller comprehension of this picture will lead to a more intelligent solution in the various instances which arise.

There still remain the difficulties of procuring

suitable blood donors and the dangers attending blood transfusion even though they are becoming less and less.

In most cases the use of various solutions if properly selected will provide a perfectly satisfactory answer to the problem and it is with these things in mind that we attempt to set forth a few simple rules which perhaps will make it easier to apply a proper solution.

In the routine treatment of surgical cases, one must remember that according to the duration of the operation itself there will be a lowering of the amount of body fluids and electrolytes due to the necessary interruption of the intake by mouth, which should be supplied parenterally. To that, one should add an amount approximately equivalent to whatever additional losses of blood or other fluids occur before, during or after the operation.

The adult patient who is not losing fluids abnormally will require from 3,000 to 3,500 cc. of fluid containing from 4 to 5 gm. of sodium chloride a day. If nothing is taken by mouth, 500 cc. of normal saline or better Ringer's solution with from 2,500 to 3,000 cc. of 5 per cent glucose in distilled water will supply his needs. If there are abnormal losses incident to the operation, he will require in addition a volume, for volume replacement, of Ringer's or lactated Ringer's solution.

There are, however, special cases which will be much better cared for if a few of the points already mentioned are taken into consideration.

The use of 5 per cent glucose in water, in addition to affording a suitable medium for instilling water, provides about 200 calories per liter which adds much to the patient's welfare. In cases of thyroid crisis, liver damage or inanition, the use of a 10 per cent solution of glucose is even better.

The laboratory provides sufficiently accurate estimations of the concentrations of the electrolytes in the extracellular fluids by determining their concentrations in the venous serum. Indeed, this may be used to measure the concentrations in all extracellular fluids.<sup>3</sup>

There are various ways of computing the amount of loss of electrolytes when it is unknown. For instance, from the determination of the plasma chloride and  $\text{CO}_2$  combining power by a mathematical formula which is quite simple, one may determine the amount of replacement necessary.<sup>4</sup>

However, from a practical standpoint, one knows that, although actual deficiency in the amount of water and electrolytes is a serious matter, the ability of the body to store up large quantities of reserves before a serious excess of them is accumulated makes it possible to use less exact criteria to determine the amount which one will give in most cases, and these rules may be used generally without waiting for these more exact laboratory determinations.

For instance, in cases of dehydration, roughly, 6 per cent of the body weight is required to restore

balance.<sup>5</sup> On account of the accompanying loss of electrolytes, normal saline, Ringer's or lactated Ringer's solution may be used. In the case of intestinal obstruction or considerable vomiting, normal saline solution is preferable, owing to the alkalosis which arises from the excessive depletion of blood chloride, always remembering that excessive saline produces edema. A patient who secretes more than 3 gm. Cl in terms of NaCl is in no danger of achlorhydric alkalosis.<sup>6</sup>

One must remember that in burns or other conditions producing a large loss of serum, if tubing is resorted to one should see that the amount of electrolytes is approximately that of serum as otherwise there is loss of electrolyte and dehydration without loss of body water. Further, in connection with this condition, there is high concentration of hemoglobin, low blood chlorides and loss of plasma protein which will be much improved by transfusion of some blood as well as the suitable solutions.

In cases of acidosis, the use of solutions resembling interstitial fluid such as Ringer's or lactated Ringer's should be used, and when there is oliguria or disturbed renal function, a solution of sodium bicarbonate or lactate Ringer's should be used and, owing to the fact that sodium bicarbonate can be sterilized in sealed ampoules only, the lactate solution is preferable.

In cases in which the Wangenstein duodenal tube is used, it is satisfactory to use normal saline, or preferably Ringer's solution rather than plain water, or one may use plain water and resort to the parenteral administration of fluids resembling interstitial fluid.

Isotonic glucose solution should seldom if ever be used subcutaneously because in addition to the local irritation it causes it also immobilizes water and extracellular electrolytes which in a dehydrated patient will further aggravate the already serious depletion of those substances.

#### SUMMARY

1. In cases of dehydration, either preoperative or postoperative, 6 per cent of the body weight of Ringer's or lactated Ringer's solution should be given. If, in addition, there is alkalosis, normal saline solution should be used.

2. The patient who is not losing fluid abnormally should be given from 3,000 to 3,500 cc. of fluid containing from 4 to 5 gm. of sodium chloride per day.

If fluid is being lost, a quantity for quantity replacement should be made in addition to the above amount.

3. When reflow through a duodenal tube is employed, the depletion of electrolyte must be accounted for by the use of some solution resembling interstitial fluid.

4. Isotonic glucose solution should rarely, if ever, be given subcutaneously and certainly never in cases of dehydration.

5. In cases of acidosis, the use of lactated Ringer's solution is preferable for the sodium lactate is converted into sodium bicarbonate during metabolism.

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#### BIBLIOGRAPHY

1. Darrow, Daniel C.: The Treatment of Dehydration Acidosis and Alkalosis, *J. A. M. A.* **114**:654-660 (Feb. 24) 1940.
2. Best and Taylor: The Physiological Basis of Medical Practice.
3. Harrison, Darrow and Yarmick: The Total Electrolyte Content of Anemias and Its Probable Relation to the Distribution of Body Water, *J. Biol. Chem.* **113**:515-529, 1936.
4. Coller, Frederick A.: The Fluid Requirements of Surgical Patients, *J. Med.* **19**:466-469 (November) 1938.
5. Charnock, Donald A.: Water Exchange in Surgical Cases, *California & West. Med.* **49**:287-290 (October) 1938.
6. Paine, Wallace and Armstrong: A Study of the Fluid and Sodium Chloride Balance in Patients Treated With Continuous Suction Applied to Dudwelling Duodenal Tubes, *Surg. Gynec. & Obst.* **68**:751-759 (April) 1939.

## CARDIOLOGY

### REVIEW OF A DECADE

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ST. LOUIS

The evolution of medicine is too broad and mighty a stream to be classified by fixed units of time. However, 1940 marks the end of the fourth decade of the 20th century and it may be of use to review such a period in order to appreciate how far medicine has advanced and the general direction which further progress may be expected to take.

In the past cardiological progress has been marked by fundamental discoveries. A few milestones are Harvey's discovery of the circulation (1628), Morgagni's work on the relation of organic changes to clinical symptoms (1761), Heberden's description of angina pectoris (1768), Withering's monograph on digitalis (1785), Laennec's discovery of the stethoscope (1819), v. Basch's bloodless measurement of the blood pressure (1881), Mackenzie's work on the pulse (1902) and Einthoven's string galvanometer (1903). The decade just passed has failed to produce any such milestone but has been characterized by a greater accumulation of detailed knowledge than has any similar previous period. Current views and theories have been submitted to critical analyses. As a result many preconceived notions have been discarded. A better appreciation of statistical methods as a check on the validity of conclusions has contributed greatly to this result.

Most significant has been the growth of facilities for the systematic study of heart disease; cardiac

So tremendous has been the number of worth while contributions to cardiology in the last ten years that if each should be acknowledged by mention of its author, the paper would be too extensive. Furthermore, almost every advance has been the result of contributions from many sources. Therefore, rather than to congest the paper with references I have compiled references containing a list of cardiological journals, a list of important cardiological works issued in the period under consideration, and references to a few comprehensive analytical monographs on cardiological subjects.

Presented at the 83rd Annual Session of the Missouri State Medical Association, Joplin, April 29, 30, May 1, 1940.



clinics have been established or improved in all medical centers. Associations and societies for the study of heart disease have been advanced greatly. In this country the American Heart Association (organized in 1922 and having 2,000 members) not only itself has grown rapidly but it has led to the establishment of numerous local organizations working along similar lines. There are now seven state associations: California, Florida, Iowa, Minnesota, Pennsylvania, Texas and West Virginia. In Missouri the Cardiac Club of St. Louis exists as an independent organization. Heart associations have developed all over Europe, one of the first to be organized was the Czechoslovakian in 1929. The most outstanding ones are the Cardiac Society of Great Britain and Ireland (and the more exclusive Cardiac Club), The Société Française de Cardiologie and the Deutsche Gesellschaft für Kreislaufforschung. Also Central and South America have seen a greatly increased interest in cardiology. In the Latin American countries there are at least three journals devoted primarily to the subject.

This activity has resulted in a tremendous growth of cardiological literature. The decade has seen the issue of many outstanding cardiological texts, of special monographs and of journals devoted to the study of cardiovascular disease. The journals that existed ten years ago have either been supplanted by better ones or have shown marked improvements in their standards.

#### DIAGNOSIS OF HEART DISEASE

No new fundamental diagnostic method has been accepted but many inherited from the preceding decade have been further developed and some have found general application. The polygraph now has been replaced almost entirely by the electrocardiograph and the use of this instrument has changed somewhat. Originally the chief purpose of the electrocardiogram was to study cardiac irregularities; but subsequently the study of the myocardial state as revealed by this method has proved of far greater practical value. As practitioners discovered that the electrocardiograph offers information not obtainable by other methods, they soon adopted it in their offices and at the bedside. In 1930, I believe, there were not ten electrocardiographs in the St. Louis area; now there must be close to fifty. The manufacturers have met the demand by devising cheaper, smaller and more portable instruments. The addition of the precordial lead has become established as a valuable addition to electrocardiographic examination and its technic has been standardized.

The introduction of the Vector electrocardiogram is a recent event. It is on trial in a few places in the country but it is still too early to say whether it will have practical value. The electrical registration of heart sounds has proved important in medical teaching. Work in progress at the present time may render the method valuable also in practice.

Percussion to determine the size of the heart has been losing ground. It has been replaced largely by fluoroscopy wherever this method has become available. The many outstanding monographs on roentgen ray diagnosis of the heart now available indicate how much this method contributes to the determination of the size and shape of the heart and the great vessels. Roentgen ray examinations of the heart always should include oblique and lateral views.

Kymography has been developed in this country during the decade but has not obtained wide clinical application. It remains a method requiring expert interpretation, the finer points of which have yet to be established. Its clinical value seems somewhat restricted.

The value of direct estimations of venous pressure as a routine procedure is also under consideration. An enormous amount of material has been accumulated on this function and on the whole it is a valuable indicator of the progress of congestive failure. However, a number of unusual findings remain unexplained. Where measurement of the venous pressure has been used routinely it has been found valuable, not only in diagnosis but also in the evaluation of treatment.

Methods to determine blood velocity and cardiac output have been used extensively in cardiovascular research but so far have proved of little clinical importance.

The shift from anatomical to etiological classification of heart disease was well on its way in the twenties and has been fully vindicated in the thirties. It has proved a better basis for the study of heart disease. During the decade the views on at least four different forms of heart disease have changed definitely.

Syphilitic heart disease is now considered preventable. It practically has been eradicated in Scandinavia. In this country adequate control of syphilis can limit that disease to a fraction of its former incidence; adequate antisyphilitic treatment will prevent the development of syphilitic cardiovascular lesions and adequate treatment of established lesions can delay their course markedly. Future generations may hope to find syphilitic heart disease extinct.

In rheumatic heart disease Laubry's views have been accepted. The progress of rheumatic heart disease depends on reactivation of the infection. Failing that, the condition may remain stationary. This explains why some patients with rheumatic heart disease live to old age. The constitutional tendency to reinfection is the most important prophylactic indication. If "rheumatic" heart patients can live under favorable hygienic conditions, preferably in a warm dry climate, their prognosis can be improved markedly. The realization of this fact is a long step from the old idea of giving five drops of digitalis on hearing a heart murmur.

Evidence has accumulated favoring the view that many cases of isolated aortic stenosis formerly

thought to be of arteriosclerotic origin are really rheumatic in nature.

The knowledge of degenerative heart disease, especially hypertension, has advanced in a rather negative way. Many of the ideas still widely held ten years ago definitely are discarded and others are subjected to renewed scrutiny. I believe that the ideas of hypertension now have been reduced to bare facts. It thus will be possible to advance by the objective methods of recording observations and drawing only such conclusions as these will permit. Within the last few years the study of renin (the renal substance which increases the blood pressure), has been renewed on an improved experimental basis.

The clinical importance of nonfatal coronary occlusion first was appreciated generally at the end of the twenties; the decade just closed added greatly to the knowledge thereof. Experimental, pathological and clinical (including electrocardiographic) studies have established a better conception of the mechanism and diagnosis of coronary occlusion. Many atypical attacks which formerly went unrecognized are now diagnosed. The treatment also has reached a simple, practical level.

#### TREATMENT

Treatment of heart disease has shown some important although rather unspectacular advances.

The indications for digitalis therapy had been established pretty well by 1930, but it remained for the subsequent decade to choose the best preparation. Because of its stability and greater accuracy in dosage, the standardized powdered leaf is now given preference over other preparations in Anglo-Saxon countries. In Germany, strophanthin, often given intravenously, is preferred. There one hears little of the dangers of the drug so frequently emphasized in this country.

Another advance has been the early use of diuretics. It was thought for a long time that if digitalis and bed rest alone could accomplish compensation, diuretics were unnecessary. It is now realized that early diuretic action will facilitate greatly the effect of digitalis and so both are given together in full doses. While digitalis for the purpose of rapid digitalization is given in much larger doses than formerly, the maximal doses recommended by Eggleston are rarely necessary. One method of digitalization which has stood the test of experience is to give three cat units three times the first day, two cat units three times the second day and one or two cat units three times a day thereafter until digitalization is achieved.

During the last few years the mercurial diuretics have increased in popularity. Thanks to the efforts of the manufacturing chemists they have been rendered less toxic. By combining them with theophylline, products have been obtained which act both on the glomeruli and the tubules of the kidney. In the treatment of congestive failure diuretics should be used early, either mercupurin

or salyrgan to which theophylline has been added. Both contain the same amount of mercury and approximately the same amount of theophylline.

The recent advances in chemotherapy have not yet saved patients with subacute bacterial endocarditis, but the encouraging experiences in related fields warrant a certain amount of optimism for the future therapy of these patients.

The relations between cardiology and surgery and obstetrics have been placed on a more rational basis during this decade. The internist is learning rapidly to distinguish between the factors which have a bearing on the risk of operation and those which can be ignored safely. Murmurs and other physical signs are not nearly as important as evaluation of cardiac reserve. The same argument applies to obstetrics and its realization has resulted in a marked lowering in the death rate from heart disease in all first rate obstetrical clinics.

#### SURGICAL TREATMENT OF HEART DISEASE

Finally, the last decade has seen a great many surgical attempts to relieve cardiovascular disorders including congestive failure, angina pectoris, hypertension and impaired peripheral circulation. Most of these were developed during the decade and may, therefore, be discussed somewhat more in detail.

In the early thirties there was much concern with thyroidectomy for congestive failure and for angina pectoris. The simple rationale of lowering the circulatory requirements by lowering the basal metabolic rate and thereby the need for oxygen and food was never accepted absolutely. Nevertheless, a considerable number of patients thus submitted to operation showed marked clinical improvement. The chief difficulty seemed to be the selection of cases; if the patients could get along fairly well on medical treatment it was thought not proper to submit them to so serious an operation, and if they were extremely sick they were often deteriorating too rapidly to benefit. Thus the difficulty was to find cases suitable for operation. In recent years less has been heard of the procedure but possibly it, or at least the principle on which it is based, some day will be resurrected.

The various operations for hypertension are still in an experimental stage: sympathectomy and denervation of the suprarenal glands have been attempted but with inconstant success. In a few spectacular cases the blood pressure fell and the patient's symptoms were markedly improved, but often the operation failed. Failure has been attributed largely to poor selection of cases for patients with far advanced cardiovascular changes are not expected to benefit from the operation. One group has shown symptomatic improvement although objectively no change was observed. One of these patients stated that her improvement particularly consisted in a loss of the feeling of nervous agitation and "drive" which had formerly been her



most serious complaint. Now she felt far more content and at ease with the world.

Most recent is the increased interest in surgical procedures for the relief of angina pectoris. Having originated about twenty years ago these procedures are based on several different principles; one already mentioned is to decrease the work of the heart by lowering the metabolic demands through thyroidectomy. Another is to attack the nervous supply of the heart, either by interrupting accelerator fibers or by interrupting sensory fibers by alcohol injections or by section of the nerves or their roots. The interruption of accelerator fibers has not been very successful and the chief difficulty with the interruption of painful impulses has been that these impulses do not always follow the same paths. Consequently operations have met with varying success. Alcohol injections as a whole have been least shocking to the patients but also least enduring.

Finally there have been attempts to relieve the cause underlying angina pectoris, that is, the impaired blood supply to the heart, by establishing collateral circulation from the chest wall to the heart. This has been attempted by sewing a part of the vascular pectoralis major muscle to the heart, by producing vascular adhesions between the two layers of the pericardium and, finally, by bringing part of the omentum up through the diaphragm and suturing it to the heart. Some success has been obtained by the originators of all of these methods but none of them as yet has proved superior to the others or even of sufficient value to become accepted generally. They all require expert surgical skill as the operations must be performed upon persons with badly damaged hearts.

I wish to close with a thought on the probable progress of the years which are to come. With certainty it can be stated that the sifting processes of the last decade will be continued and that our knowledge will become progressively better founded. The large amount of work which is being done to explore the essential nature of the degenerative processes of which hypertension is a part and of heart failure as yet has hardly gotten beyond the clarification of the issues and unless the next few years should see the development of some new fundamental conception, I doubt whether the immediate future will see the solution of these, the most essential problems, in cardiology. Rather, cardiology is likely to advance by the slow accumulation of well founded data, laboriously collected.

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#### BIBLIOGRAPHY

##### *Cardiological Journals*

- American Heart Journal, St. Louis.  
Modern Concepts of Cardiovascular Disease, New York.  
British Heart Journal.  
Archives des Maladies du Cœur et des Vaisseaux, Paris.  
Zeitschrift für Kreislaufforschung, Dresden, Leipzig.  
Archiv für Kreislaufforschung, Dresden, Leipzig.  
Verhandlungen der Deutschen Gesellschaft f. Kreislaufforschung, Dresden, vols. I-XII.  
Cuore e Circolazione, Rome.  
Archivos latino americanos de cardiología y hematología, Mexico City.

Revista Argentina de cardiología, Buenos Aires.  
Revista cubana de cardiología, Habana.  
Cardiologia, Basel.

##### *Books on Heart Disease Issued 1929-1940* *General Cardiology*

- White, P. D.: Heart Disease, 2nd ed., Macmillan, 1937.  
Levine, S. A.: Clinical Heart Disease, Saunders, 1936.  
Christian, H. A.: Diagnosis and Treatment of Disease of the Heart, Oxford, 1935.  
Hochrein, M.: Herzkrankheiten, Steinkopf, 1940.  
Herrmann, G. R.: Synopsis of Diseases of the Heart and Arteries, Mosby, 1936.  
Lewis, T.: Diseases of the Heart, 2nd ed., Macmillan, 1937.  
Cowan, J. M., and Ritchie, W. T.: Diseases of the Heart, 3rd ed., Wood, 1935.  
Bramwell, C.: Heart Disease, Longman, 1932.  
East, C. F. T., and Bain, C. W. C.: Recent Advances in Cardiology, 3rd ed., Blakeston, 1936.  
Lutembacher, R.: Les Lésions organique du Cœur: Etude clinique, Masson, 1936.  
Edens, E.: Die Krankheiten des Herzens u.d. Gefässe, Springer, 1929.  
Frey, W.: Die Herz u. Gefässkrankheiten, Springer, 1936.  
Laubry, Ch.: Leçons de cardiologie faites à l'hôpital Broussais, 1<sup>er</sup> ser 1935, 2<sup>me</sup> ser 1938, Doir.  
American Heart Association: Nomenclature and Criteria for Diagnosis of Diseases of the Heart, American Heart Association, 4th ed., 1939.  
Brugsch, T.: Pathologie des Kreislaufes, 2nd ed., Hirzel, 1937.  
Aastrup: Prognosis in Chronic Heart Disease, Levin, 1937.

##### *Congenital Heart Disease*

- Abbott, M. E.: Atlas of Congenital Heart Disease, American Heart Association, 1936.  
Schmitker, M. A.: Electrocardiogram in Congenital Cardiac Disease, Harvard University Press, 1940.

##### *Rheumatic Heart Disease*

- Dietrich, S.: Rheumatische Kreislaufstörungen, Steinkopf, 1938.

##### *Syphilitic Heart Disease*

- Stadler, E.: Syphilis des Herzens u.d. Gefässe, 1932.  
Arteriosclerosis and Hypertension  
Winternitz, M. C.; Thomas, R. M., and LeCompte, P. M.: The Biology of Arteriosclerosis, Thomas, 1938.  
Cowdry, E. V.: Arteriosclerosis, Macmillan, 1933.  
Fishberg, A. M.: Hypertension and Nephritis, 4th ed., Lea & Febiger.  
Crile, G.: The Surgical Treatment of Hypertension, Saunders, 1938.

##### *Coronary Disease*

- Condorelli, L.: Die Ernährung des Herzens, Steinkopf, 1932.  
Levy, R. L.: Diseases of the Coronary Arteries and Cardiac Pain, Macmillan, 1936.  
Laubry, P.: Les coronaires et le problema de la douleur cardiaque, Doir, 1939.  
Hochrein, M.: Der Myokardinfarkt, Steinkopf, 1937.  
Miller, H. R.: Angina Pectoris, Wood, 1939.  
Hyman, A. S.: The Failing Heart of Middle Life, Davis, 1932.

##### *Electrocardiography*

- Barnes: Electrocardiographic Patterns, Thomas, 1940.  
Pardee, H. E. B.: Clinical Aspects of the Electrocardiogram, 3rd ed., Hoeber.  
Lewis, T.: Clinical Electrocardiography, 6th ed., Chicago Med., 1937.  
Lewis, T.: Clinical Disorders of the Heart Beat, 7th ed., Chicago Med., 1933.  
Wiggers, C. J.: Principles and Practice of Electrocardiography, Mosby, 1929.  
Carter: Fundamentals of Electrocardiographic Interpretation, Thomas, 1937.  
Scherf, D., and Boyd, L. J.: Clinical Electrocardiography, Mosby, 1940.  
Boden, E.: Elektrokardiographie für die ärztliche Praxis, 5th ed., 1939.  
Weber, A.: Die Elektrokardiografie u. andere graph. Meth. d. Kreisldiagn., Springer, 1937.  
Schmitker, M. A.: Electrocardiogram in Congenital Cardiac Disease, Harvard University Press, 1940.  
Schallong, F.: Grundzüge einer klinischen Vektor diagnose des Herzens, Springer, 1939.

##### *Roentgenology*

- Laubry, Ch.; Cottenot, P.; Routier, D., and Heim de Balsac, R.: Radiologie clinique du cœur et des gros vaisseaux, Masson, 1939.  
Roessler, H.: Clinical Roentgenology of the Cardiovascular System, Thomas, 1937.  
Zdansky, E.: Roentgendiagnostik des Hersens u.d. grossen Gefässe, Springer, 1939.  
Perona, P.: Le Roentgenchimografia cardiovascolare, Bel-luno, 1939.  
Master, A. M.: The Electrocardiogram and X-ray configuration of the Heart, Lea and Febiger, 1939.  
Kurz, C. M.: Orthodiascopy, Macmillan, 1937.

*Heart Failure*

- Harrison, T. R.: *Failure of the Circulation*, 2nd ed., Williams and Wilkins, 1939.  
 Fishberg, A. M.: *Heart Failure*, Lea, 1937.  
 East, C. F. T.: *Failure of the Heart and Circulation*, Bale, 1937.

*Heart Disease and Pregnancy*

- Bramwell, C., and Longson, E. A.: *Heart Disease and Pregnancy*, London, 1938.  
 Jensen, J.: *The Heart in Pregnancy*, Mosby, 1938.

*History*

- Rolleston, H.: *Cardiovascular Diseases Since Harvey's Discovery*, Cambridge Univ. Press, 1928.  
 Bishop, L. F.: *History of Cardiology*, Foben, 1938.  
 Heinrich, H.: *Die Geschichte d. angeborenen Herzkrankheiten*, Nolte, 1937.

*Miscellaneous*

- Grollmann: *The Cardiac Output of Man in Health and Disease*, Thomas, 1932.  
 Warburg, E. J.: *Subacute and Chronic Pericardial and Myocardial Lesions Due to Non-penetrating Traumatic Injuries*, Oxford, 1938.  
 Franklin: *A Monograph on Veins*, Thomas, 1937.  
 Jagie and Traum, E.: *Therapie d. Herzkrankheiten*, 2nd ed., Urban, 1937.  
 Luten, D.: *The Clinical Use of Digitalis*, Thomas, 1936.  
 United States Public Health Service: *Studies of Heart Disease Mortality*, 1936.  
 Moon, V. K.: *Shock and Related Capillary Phenomena*, Oxford, 1938.

*Selected Reviews*

- Levine, S. A.: *Coronary Thrombosis*, Med. S.:245, 1929.  
 Blumgart, H. L.: *The Velocity of Blood Flow in Health and Disease*, Med. 10:1, 1931.  
 Fischer-Wasels, B.: *Die Funktionellen Störungen des peripheren Kreislaufs*, Frankfurt, Ztschr. f. Path. 45:1, 1933.  
 Shennan, T.: *Dissecting Aneurysms*, Med. Res. Coun., Spec. Rep. Ser. 193, London, H. M. Stat. Off., 1934.  
 Brenner, O.: *Pathology of the Vessels of the Pulmonary Circulation*, Arch. Int. Med. 56:1935.  
 Duff, G. L.: *Experimental Cholesterol Arteriosclerosis and Its Relationship to Human Arteriosclerosis*, Arch. Path. 20:1935.  
 Evans, W.: *The Course of the Oesophagus in Health and in Diseases of the Heart and Great Vessels*, Med. Res. Coun., Spec. Rep. Ser. 208, London, H. M. Stat. Off., 1936.  
 Parkinson, J.: *Enlargement of the Heart*, Lancet, 1936.  
 Palmer, J. H.: *The Development of Cardiac Enlargement in Disease of the Heart*, Med. Res. Coun., Spec. Rep. Ser. 222, London, H. M. Stat. Off., 1937.  
 Yater, Wm.: *Pathogenesis of Bundle Branch Block*, Arch. Int. Med. 62:1, 1938.  
 Keil, H.: *Rheumatic Subcutaneous Nodules and Simulating Lesions*, Med. 17:261, 1938.  
 Altschule, M. D.: *The Pathological Physiology of Chronic Cardiac Decompensation*, Med. 17:75, 1938.  
 Blumgart, H. L.; Schlesinger, M. J., and Davis, D.: *Studies on the Relation of the Clinical Manifestations of Angina Pectoris, Coronary Thrombosis and Myocardial Infarction to the Pathological Findings*, Am. Heart J. 19:1, 1940.

## POSSIBILITY OF DELAYED POISONING DUE TO LEAD OF EMBEDDED BULLET

The possibility of delayed lead poisoning from embedded bullets should be considered in making a decision as to the removal of the bullets, Willard Machle, M.D., Cincinnati, declares in *The Journal of the American Medical Association* for November 2. He reports two such cases.

Although some physicians believe that bullets remaining in tissues cannot give rise to lead poisoning, Dr. Machle maintains that this unquestionably does occur, although rarely. The cases, he reports, show lead absorption comparable to that found in occupational lead poisoning.

"With the present means for determining the magnitude of lead absorption," he says, "uncertainty need no longer exist. If significant amounts of lead are being absorbed from a projectile in the tissues, the fact may be established readily and the likelihood of intoxication (poisoning) estimated."

The symptoms of lead poisoning are severe colic, constipation, a bluish line on the gums, nerve injury, headache, dizziness and general weakness. To make a proper diagnosis, however, the amount of lead in the body tissues and fluids should be determined.

## THE DIAGNOSIS OF RENAL LESIONS

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Lesions of the kidney present many pitfalls in diagnosis. The clinical signs and symptoms are rarely pathognomonic and the interpretation of the initial symptom is frequently misleading. Nausea, vomiting, malaise, indefinite abdominal pain, loss of weight or strength, nocturia, frequency of urination, hematuria and fever are some of the presenting symptoms.

Nausea and vomiting often are late manifestations of renal disease that give few if any symptoms referable to the genito-urinary tract. Conditions in the stomach, gallbladder, intestines, appendix, pelvis and spleen may cause referred pain and symptoms that simulate renal disease. Nausea and vomiting<sup>1</sup> have been reported in 40 per cent of a series of malignant disease of the kidney. The following case is illustrative of the predominance of gastrointestinal symptoms in carcinoma of the kidney.

### CASE REPORT

Case 1. C. E. D. Male, aged 62, complained of nausea, vomiting and progressive weakness for a year. Roentgen examination of the gastrointestinal tract showed it to be normal. There was an indefinite, irregular, homogeneous mass in the region of the right kidney. The pyelograms showed a constant deformity with compression and irregularity of the pelvis and loss of normal outline of the calices. On autopsy the gross specimen was a large tumor mass involving the right kidney. On section little normal tissue was found. The pelvic mucosa was free from any involvement. The renal vein was greatly dilated and invaded by the tumor mass. Microscopic examination showed areas of sclerosis with obliteration of the major portion of the renal tissue. There were areas of proliferation and hemorrhagic changes typical of a primary carcinoma.

The clinical manifestations in primary carcinoma of the kidney depend on the location, size, rate of growth of the tumor and whether or not the pelvis is invaded. Metastasis usually occurs through the lymphatics. Dissemination through the blood stream is rare. There is a tendency to invade the surrounding structures which makes operative removal difficult. Most cases show local recurrence. In advanced cases the tumor may grow into the pelvis and, if so, it is difficult to determine the primary site of the lesion.

Pain is probably the most frequent presenting symptom. Behan<sup>2</sup> estimates that 90 per cent of all diseases begin with or have pain as a prominent symptom at some time during their course. Kretschmer<sup>3</sup> noted pain in varying degrees and sites but with no definite characteristics. Movable kidney, ureteral lesions, extra-renal or extra-ureteral compressions, gastrointestinal and pelvic lesions may produce symptoms simulating renal pain. In-

<sup>1</sup>Presented at the 83rd Annual Session of the Missouri State Medical Association, Joplin, April 29, 30, May 1, 1940.



affected lesions of the kidney are prone to have considerable pain that is often not typical.

The following case report is of a patient with severe abdominal pain. The physical and laboratory findings did not point to kidney disease yet on laparotomy a closed hydronephrotic pelvis in the presence of a double ureter and pelvis was found.

#### CASE REPORT

Case 2. W. H. A. Male, aged 45, had chief complaint of nonradiating pain in the small of the back for five years and constant pain for six months; was quite weak, no weight loss and no kidney tenderness. The roentgen examination showed the right kidney normal in size, shape and position. The left kidney outline was not seen. Pyelograms showed a normal right kidney pelvis and ureter. The left ureter showed a tortuous course upward and outward. There is a displacement of the pelvis and calices at least eight inches from the median line.

Laboratory findings were no pus from either kidney, phenolsulphonphthalein test 50 per cent (in two hours); nonprotein nitrogen 30; Hbg. 70 per cent; white blood cells, 8,000. Operation was exploratory laparotomy and left nephrectomy. Specimen consisted of an enormously enlarged kidney. There was a double ureter and pelvis. The upper ureter was closed off with a hydronephrotic kidney. Diagnosis was hydronephrosis and hydro-ureter.

Anomalies of the kidney may be classified as anomalies of number, position and form. The occurrence of duplication of the pelvis and ureter is of statistical interest only, but the fact remains that surgical complications are encountered more frequently in the presence of anomalies. Duplication of the kidney pelvis and ureter occur in from 1 to 4 per cent of all individuals.<sup>4</sup> The most common anomaly encountered is the unilateral division of the ureter into a Y in the upper third. The most frequent pathological conditions found in duplication of the kidney pelvis and ureter are hydronephrosis and pyelonephritis.

Blood in the urine is a frequent symptom in lesions of the kidney and one that should call for exhaustive study of the genito-urinary tract. The bleeding is often intermittent. Unless associated with considerable pain, the hematuria may be minimized and the patient lured into a false sense of security until later he returns with an advanced renal disease. Hematuria may be due to intrinsic and extrinsic lesions of the genito-urinary tract,<sup>5</sup> systematic causes and essential hematuria. Allergic response of the kidney has been suggested in some cases of hematuria associated with localized retinal edema.<sup>6</sup> It has been noted after violent exercise with cold as an added factor.<sup>7</sup> Hematuria may result from trauma, vascular congestion or from the ulcerative destruction of normal vessels or those found in association with the development of tumors.<sup>8</sup>

Chute<sup>9</sup> reports that in one hundred cases of proved hematuria 44 per cent were due to malignancy. Kretschmer<sup>3</sup> in eight hundred and thirty-three cases noted that 39 per cent were due to lesions of the kidney. Disease of the ureter is a

relatively uncommon cause of hematuria with the exception of calculi. Recently papillitis has been recognized as a cause of renal bleeding.<sup>10</sup>

The most common causes of renal hematuria are tuberculosis, calculi, infection and tumors.<sup>3</sup> The presence of calculi or the ordinary pyogenic infection does not rule out tuberculosis or tumor as many instances of double lesions of the kidney, notably calculi and tumor, have been reported.<sup>3</sup> Hematuria may occur in acute fevers, nephritis, cardiovascular disease, purpura, varicosities and angioma<sup>11</sup> of the kidney pelvis and after the administration of various drugs. It is important that one recognize the fact that renal complications, notably hematuria, abdominal pain, nitrogen retention and complete anuria occur following the administration of sulfapyridine. Southworth and Cooke<sup>12</sup> report three cases in which hematuria occurred in association with the administration of this drug; two cases had abdominal pain simulating renal colic with a nitrogen retention due to renal insufficiency. These symptoms were relieved promptly when sulfapyridine was discontinued and fluids were increased. Carrol, Shea and Pike<sup>13</sup> report one case which, after four days of sulfapyridine administration, developed gross hematuria, abdominal cramps and pain. The next day after the drug was discontinued the urinary output was 100 cc. of bright red blood and the following day the urinary output was nil and the nonprotein nitrogen was 53. Cystoscopy was performed and several small soft concretions which dissolved in warm water were found on the floor of the bladder. A retrograde pyelogram revealed a filling defect in both the right and left kidney pelvis which disappeared after thorough lavage. There was immediate clinical improvement and the urinary output and nonprotein nitrogen returned to normal. The concretions found in the genito-urinary tract following the use of sulfapyridine are made up of acetylsulfapyridine crystals precipitated from a supersaturated solution, hence the forcing of fluids in conjunction with this drug is probably appropriate.

In discussing renal tuberculosis, Taylor<sup>14</sup> states that the tubercle bacilli are deposited in the kidney during the phase of the primary infection. The lesion in the kidney is recognized radiographically only when it deforms a portion of the renal sinus. Early recognition of the disease is possible only when localization of the tubercle bacillus occurs at the renal papilla. When there is no encroachment upon the renal sinus, there is no roentgen evidence of disease and the roentgenographic evidence is also not necessarily indicative of the size or extent of the lesion.

#### CASE REPORT

Case 3. E. B., aged 24, had chief complaint of hematuria, frequency, nocturia, pain in the left side and swelling of right testis of four and one half months duration. Both hips had been stiff since the age of 6. There was tenderness over the left kidney. The right epididymis was swollen. Roentgenograms showed the

left kidney large and slightly irregular in outline. Pyelogram showed an indefinite irregular outline of the left kidney pelvis with apparently considerable destruction of the cortical portion of the kidney. Left nephrectomy was done. Gross specimen was a large fluctuant kidney. There was definite thickening of the ureteral wall. The renal parenchyma was replaced almost completely by multiple cortical abscesses. Microscopically, there was little functioning kidney remaining. Diagnosis was tuberculosis, nephritis and ureteritis.

Traumatic conditions of the kidney have come to play an important role as a cause of hematuria. The modern traffic situation has no doubt contributed to this. Prather<sup>15</sup> reported a series of twenty cases which he classified under four headings: (1) contusions, (2) subcapsular rupture, (3) rupture of kidney and capsule, (4) severance of the pedicle.

Fifty per cent of these cases were classified as "contusions of the kidney." Of these, 60 per cent voided urine showing gross blood and microscopic blood was obtained from the remaining 40 per cent. There was pain in the renal area soon after the injury. Nausea and vomiting with pain was observed in only one case. There was no shock, no abdominal distention and no bulging of the flank. One case of subcapsular rupture which showed gross blood in the urine, no shock or abdominal distention, was treated conservatively and made a good recovery.

There were eight cases of true rupture of the kidney, gross blood in the urine in six, nausea and vomiting with pain in four. Farman<sup>16</sup> reports three additional cases of rupture of the kidney.

Traumatic severance of the pedicle is extremely rare and usually fatal within a few hours. Prather<sup>15</sup> reports a case which survived five hours.

The symptoms of hypernephroma are not characteristic. Hematuria, pain and tumor are the classical ones. Kretschmer<sup>1</sup> noted this triad in only 18 per cent. Cachexia and fever are usually late symptoms. Not infrequently evidences of metastasis are discovered before the kidney is suspected. The tumor is formed of varying sized nodules of soft yellow tissue with many hemorrhagic areas. Grawitz considered that these arose from metaplasia of small misplaced islands of adrenal tissue. There is a remarkable tendency to invade the renal vein. Extension to the other kidney, or as far as the heart, is not infrequent. The cells of the tumor are large, clear, columnar or cylindrical, with a delicate stroma and with a network of fine blood vessels.

The roentgenogram may show symmetrical enlargement of the kidney shadow or some local projection. There may be areas of increased density and partial or complete loss of the kidney shadow when the tumor is large. The pyelographic signs are usually diagnostic and consist of elongation, flattening, narrowing and even obliteration of one or more of the calices.

In the following case hematuria was the outstanding symptom. The recent thyrotoxicosis overshadowed the renal complaints.

#### CASE REPORT

Case 4. L. E. G. Female, aged 63, chief complaint was blood in the urine for three weeks with some frequency and terminal dysuria at onset. She had noted blood in urine for two years. Thyroidectomy had been done two months previously. Patient was quite weak. Right kidney was tender to percussion. Roentgen examination showed an irregularity of the upper pole of the right kidney. Pyelograms showed a lack of filling of the right middle major calyx. Intravenous pyelograms revealed delayed function of the right kidney.

Laboratory tests showed numerous white and red blood cells in urine. Hbg. was 50 per cent, white blood cells, 8,900.

Right nephrectomy was done. The gross specimen consisted of a normal sized kidney with a tumor mass 7 cm. in diameter on the convex surface that was of a yellowish brown color with numerous red hemorrhagic areas. Microscopic examination showed that the tumor was composed of large bulky areas with no attempt at formation of tubules or glands. Diagnosis was hypernephroma.

A palpable mass in the kidney region usually presents a problem in diagnosis. An enlarged spleen, a Riedel's lobe of the liver, retroperitoneal cysts and tumors in the region of the kidney may stimulate kidney masses. A gastrointestinal examination is a necessity. A shadow on the roentgenogram separate from that of the kidney would be conclusive. Any displacement of the ureter is suggestive of a renal tumor, although extrinsic lesions, retroperitoneal growths, cysts and hydronephrosis may cause displacement. An extrarenal tumor may deform the pelvis by pressure while a tumor in the pelvis may not change the contour or outline until it is large enough to produce obstruction. Certain anomalies, congenital cysts<sup>17</sup> and polycystic kidney may present irregularities suggestive of tumor.

#### CASE REPORT

Case 5. H. R. Male, aged 50, chief complaint was slow growing painless mass in the upper right quadrant of three months' duration associated with loss of fifty pounds in weight and frequency of urination. There was a hard, non-tender mass in the right abdomen reaching from the costal margin to the midline and well below the umbilicus.

Roentgen examination showed a large dense homogeneous mass involving the right side. The kidney was seen above and to the medial side of the mass. Pyelograms showed a marked displacement and irregularity of the right kidney pelvis with a displacement of the right ureter toward the median line. At operation a large mass obscuring the right kidney was removed in toto. Gross specimen was a lobulated tumor mass 11 by 20 by 26 cm. that was reddish yellow in color. Microscopic examination showed a loosely arranged tumor composed of neurogenic cells with ganglionic cells and neurones. There were smaller stellate cells with one or more polar processes. Diagnosis was ganglionic neuroma.

Many tumors consisting of ganglion cells have been described as arising from all parts of the body but most often from the retroperitoneal, pelvic or retrocervical region where they might have arisen in connection with the sympathetic system. The ganglion cells usually are developed imperfectly and are irregular in form. There is no proper con-



nection with any nerve ending. They are usually benign tumors but a few have shown extensive metastases which seem to have developed from the smaller and less differentiated cells. In our case recurrence took place three years later. A large mass was removed with diagnosis of recurrent ganglionic neuroma. One year later a second recurrence took place. At operation a tumor weighing 2,135 grams was removed. The patient died on the third postoperative day and at autopsy several small tumor masses were found in the right kidney area. Microscopic diagnosis was ganglionic neuroma. Although there were several tumors in the same vicinity, no evidence of metastasis was found.

The symptom of fever is fairly constant in infectious lesions of the kidney. The following case presented clinical and radiographic evidence of a renal lesion, yet the fever was shown to be due to an extra-renal disease of an unusual variety.

#### CASE REPORT

Case 6. D. C. Female, aged 61, chief complaint was severe pain in the left flank radiating downward and blood in the urine for a month. Patient was undernourished. There was a mass in the left abdomen almost to the midline and extending three fingers below the umbilicus. Roentgen examination showed a stone in the left kidney pelvis with a large indefinite mass in the left side surrounding the kidney. There was no line of demarcation between this mass and the spleen. Pyelograms showed a dilated distorted left kidney pelvis. Laboratory examination showed urine contained many red blood cells; Hbg. 51 per cent; red blood cells 2,130,000; white blood cells 9,600; polymorphonuclears 84 per cent; phenolsulphonphthalein test 45 per cent. Operation was left pyelolithotomy. The patient became steadily worse and ran a high septic temperature. Thirteen days after the original operation, an exploratory operation was done because of the continued fever and the mass in the left side. There was a large spleen considered not removable. At autopsy there was a general peritonitis and a very large spleen.

Microscopic examination showed only an occasional malpighian body. There was little normal pulp found. Large areas were involved in tubercle formation with extensive necrosis and caseation surrounded by numerous giant cells. Diagnosis was tuberculosis of spleen, liver and mesenteric nodes.

In dissemination of tubercle bacilli through the blood stream the spleen<sup>18</sup> is certain to be involved. Rokitsansky has pointed out that one finds at post-mortem that it affects the spleen only less frequently than the lungs and lymph nodes. Primary tuberculosis of the spleen is rather rare. Winteritz has collected fifty-one cases from the literature. The symptoms reported are not characteristic. There is nausea and vomiting, backache, fever and night sweats. The white blood count usually is not affected. Polycythemia was noted frequently. Tuberculosis of the liver and lymph nodes usually is associated.

#### CONCLUSION

Lesions of the kidney present a problem in diagnosis. Clinical signs are often misleading. The gastrointestinal symptomatology is usually a late manifestation of advanced renal disease.

Pain is probably the most frequent presenting symptom and we have been impressed with the seriousness of hematuria as a symptom and the desultory nature of the usual investigation directed toward its solution.

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#### BIBLIOGRAPHY

1. Kretschmer, H. L.: Early Diagnosis of Malignant Disease of the Kidney, South. M. J. **17**:92 (February) 1925.
2. Behan, R. J.: Pain, New York, Appleton, 1914, p. 1.
3. Kretschmer, H. L.: Hematuria, A Clinical Study Based on 933 Consecutive Cases, Surg. Gynec. & Obst. **40**:683 686 (May) 1925.
4. Crowell, A. J., et al.: Pathological Conditions Arising in Duplication of the Kidney Pelvis and Ureter, South. M. J. **24**:741 (September) 1931.
5. Eisendrath, D. N.: Hematuria, Its Interpretation, J. A. M. A. **86**:825 (Mar. 20) 1926.
6. Coca: Essential Hematuria and Localized Retinal Edema as Possible Allergic Symptoms, Bull. New York Acad. Med. **6**:593-604 (September) 1930.
7. Stevens, A. R.: Hematurias of Obscure Origin, J. A. M. A. **79**:1302 (Oct. 14) 1922.
8. Herman, L.: Renal Hematuria, J. A. M. A. **83**:1315 (Oct. 25) 1924.
9. Chute, A. L.: Importance of Hematuria as a Symptom, J. A. M. A. **83**:1321 (Oct. 25) 1924.
10. Keyes, E. L.: Urology, New York, Appleton, 1928, p. 352.
11. Hyman, A.: Renal Hematuria, Am. J. Surg. **34**:312 (December) 1920.
12. Southworth, H., and Cooke, C.: Hematuria, Abdominal Pain and Nitrogen Retention Associated with Sulfapyridine, J. A. M. A. **112**:1820-1821 (May 6) 1939.
13. Carroll, G.; Shea, J., and Pike, G.: Complete Anuria Due to Crystalline Concretions Following the Use of Sulfapyridine in Pneumonia, J. A. M. A. **114**:411-412 (Feb. 3) 1940.
14. Taylor, Henry K.: Renal Tuberculosis, Am. J. Roentgenol. **12**:700-707 (November) 1939.
15. Prather, George C.: Traumatic Conditions of the Kidney, J. A. M. A. **114**:207-210 (Jan. 20) 1940.
16. Farman, Franklin: Diagnostic and Operative Factors in Traumatic Rupture of the Kidney, J. A. M. A. **114**:210-217 (January) 1940.
17. Braasch, W. F., and Carmen, R. D.: Pyelographic and Roentgenologic Diagnosis of Renal Tumor, Radiology **4**:445 (June) 1925.
18. Bunting, C. H., in Tice, Practice of Medicine, **8**:290.

#### OBSTRUCTION OF ARTERIES OF A KIDNEY CAUSES HIGH BLOOD PRESSURE

Evidence that high blood pressure is the result of obstruction of the arteries of a kidney is presented in *The Journal of the American Medical Association* for September 14 by Nelson W. Barker, M.D., and Waltman Walters, M.D., Rochester, Minnesota, who cite five cases in which the blood pressure returned to normal after the affected kidney was removed.

The pressure has remained normal for some months in four of the patients; in the fifth case sufficient time has not elapsed since operation to make a definite statement, the authors say.

In further support of their contention Drs. Barker and Walters state: "In twenty-six, or 45.6 per cent, of a series of fifty-seven cases in which a diagnosis of chronic atrophic inflammation of a kidney was made by x-ray study there was an elevation of blood pressure. In twenty-four cases in which chronic atrophic inflammation of a kidney was diagnosed after its surgical removal fifteen, or 62.5 per cent, showed an elevated blood pressure and eleven, or 45.8 per cent, definite hypertension."

"The incidence of all types of reactions was no greater from the transfusion of preserved blood than when fresh blood was employed, provided proper care was taken in storing and handling it," Elmer L. DeGowin, M.D., and Robert C. Hardin, M.D., Iowa City, report in *The Journal of the American Medical Association* for September 14. Their findings are based on a study of the results of 295 fresh blood and 2,128 stored blood transfusions.

## ADDISON'S DISEASE

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Addison's disease is caused by hypofunction of the adrenal glands. It was first described by Addison in 1855 and so carefully did he describe the syndrome that few characteristic signs or symptoms have been added in the eighty-five years that have elapsed. The earlier autopsies showed tuberculosis to be the primary cause in 80 per cent of the cases. Recent studies show that atrophy and aplasia cause fully 50 per cent; tuberculosis is second and syphilis third. Atrophy may involve both the cortex and medulla of the adrenal glands. Aplasia may be bilateral or unilateral. If unilateral, the other gland may show marked atrophy.<sup>1</sup>

The cortical hormone controls the passage of sodium between the blood plasma and the tissue cells. If the cortical hormone is deficient, the sodium passes from the blood into the tissues and, as it passes into the kidney, it is lost to the body in urine. As the loss of sodium progresses, water loss follows resulting in a dehydration and blood concentration. There is a change in mineral metabolism, in glycogen metabolism resulting in hypoglycemia and in blood pressure causing a hypotension.

*Signs and Symptoms.*—Pigmentation of the skin is usually an early symptom; however, it is possible for the disease to exist without this symptom being noticeable. The onset is usually slow, there is progressive weakness and dizziness and later there are many gastrointestinal disturbances such as nausea, diarrhea and indigestion. There is also a loss of appetite, aversion to fatty foods and fatigue on the slightest exertion. Dehydration also may develop, the severity of which depends on the stage of the disease. In the latter stages these symptoms may increase together with many neurological symptoms such as aphasia and disorientation. Hypoglycemia may accompany these symptoms together with hypotension, collapse and death. Hypoglycemia and hypotension may be mild or severe as an Addisonian crisis develops. Death is often sudden and in many cases is preceded by a fall in the blood sugar. The disease in the past has not extended over two years and the average length of life after recognition has been from thirteen to sixteen months. The course is marked by remissions and relapses.<sup>2</sup>

It is now about twelve years since Rogoff and Stewart<sup>3</sup> (in 1928) demonstrated the activity of adrenal cortex in the treatment of adrenal gland disease. By administering adrenal cortex to adrenalectomized animals they were able to prove the efficiency of this extract in sustaining life. Hartman, working independently, did practically the same work simultaneously. The results indicated that cortical extract was capable of controlling acute

symptoms of Addison's disease as well as those of lesser adrenal cortical deficiency. Since that time many workers have given their attention to this field of investigation and the laboratory especially has been responsible for the development of the cortical extracts which are available today. There has been a gradual improvement through the years. In 1929 Pfiffner and Swingle<sup>4</sup> and others provided a more active adrenal cortical extract and from that time on the mortality rate of patients suffering from Addison's disease has been changed considerably; that is, their span of life has been lengthened so that they may live several years, whereas previously most died within a few months and none were able to carry on any work.

In 1934, Loeb<sup>5</sup> discovered that along with the extract the administration of extra salt was beneficial. It was found that adrenalectomized dogs, maintained with the addition of salt, excreted more sodium than chloride. Previous to that time, all the animals had been given plain sodium chloride or salt as it had been proven that it assisted the effect of the cortical extract. The object was to maintain normal concentration of the urea and the plasma so it was decided to give sodium citrate along with sodium chloride. This solution was given to many patients under the label of Addison's Elixir.

A little later it was recognized that it was important to control the intake of potassium. The restriction of potassium intake, therefore, required adjustment in the diet. This diet was worked out at the Mayo Clinic by Sister Mary Victor. By 1937 the clinical results published by Snell and Houser were much improved due to the administration of sodium chloride, sodium citrate and limitation of potassium.

About twenty crystalline substances have been isolated from the adrenal gland. They belong to a class of substances which contain the four ring substance. The term "steroid" is applied to any substance which contains this four ring system, thus the adrenal compounds are steroids.<sup>6</sup> Some of these compounds are compared with the female hormone, estrone (theelin), the male hormone, testosterone, and the hormone of corpus lutein, progesterone. The system of four rings is common to all of these. The latest substance discovered, apparently the most valuable one in the treatment of adrenal cortex deficiency, is desoxycorticosterone. It was made available by the work of Steiger and Richstein. This product apparently eliminates some of the effects which are present in use of the other cortical extracts. One of the most important things is that it is not necessary to give the extra amount of sodium and limit the potassium; in fact, according to the present workers, this may be detrimental. It remains to be proven just how much one can depend on this extract alone. Other valuable factors which apparently this extract has shown are the increase in the blood pressure, the change in the mineral metabolism and the carbohydrate

<sup>1</sup>Read before the staff meeting of the Freeman Hospital, Joplin, June 13, 1940.



metabolism. Thus the treatment for Addison's disease is changing entirely in the matter of diet since a larger amount of potassium, which is dangerous to the patient who is not receiving desoxycorticosterone acetate, can be given. Apparently it is a regulator of the disturbed salt and water balance which is lacking in patients who have Addison's disease.

Hypoglycemia has been a danger in many of these cases. It may be that this newer product or even one better will be of inestimable value to these sufferers and in addition protect their carbohydrate metabolism, prolong their life for many years and restore them to usefulness to society as the discovery of insulin has done for the diabetic patient.

#### REPORT OF CASES

Case 1. W., aged 51, bachelor, bank clerk, was seen by me on May 3, 1934. He was referred by Dr. Post and said that he had not felt well for some months. During the last few weeks he had been much worse and since March 14 his eyes had started to give him trouble. He was unable to see and continue his work. He was weak, nervous, very thin and emaciated. The physical examination showed his blood pressure to be 90/40. No other important clinical history or physical findings were noted except laboratory report showed Wassermann negative, red blood count 2,984,000, white blood count 8,250, hemoglobin 60 per cent, polymorphonuclears 44 per cent.

The skin was just beginning to show a bronze appearance. He continued under my care for the next six years until he died in 1940. He was given liver extract regularly to maintain his blood count which fluctuated during the entire period. On May 24, 1934, his blood count was 4,615,000 red blood cells, 4,250 white blood cells, hemoglobin 70 per cent. Treatment was continued rather aggressively with liver extract and on July 6, 1934, his red cell count was 5,445,000, white cell count 7,500 and hemoglobin 80 per cent. Urine remained normal. His condition remained about the same during the period of years with slight remissions and relapses until about two weeks previous to his entry to the hospital when he developed a true Addisonian crisis. He was given all the available cortical extracts with glucose in large amounts and was supported with every measure possible, yet he failed to respond to treatment. At the time he developed this Addisonian crisis, he developed a pronounced dehydration and rapid loss of weight despite the fact that he was given large quantities of fluid and his diet and treatment managed according to the best knowledge of the disease today. He developed a severe diarrhea, severe mental symptoms and disorientation. He had a particular aversion from the beginning to taking food. It was almost impossible to get him to take any kind of food without a strenuous effort.

Case 2. C., aged 62, married, stonemason, was seen by me June 11, 1935. He had a history of being tired, loss of appetite, loss of weight and a beginning bronzing of the skin which covered the entire body, more pronounced on the chest and abdomen. At that time he had a blood pressure of 180/90. His red cell count was 4,900,000, white cell count 5,500 and hemoglobin 80 per cent. He was given the various cortical extracts with variable results for the next four years. He died on April 3, 1939. It is interesting that this man had a hypertension when first seen with an arteriosclerosis evidenced by the superficial arteries. About one year following the time when I first saw him he had a cerebral accident which caused a partial aphasia and a paralysis on the right side. Following this he made a fair recovery but never gained his strength sufficiently

to continue work for any length of time. In June 1938 he developed a right coronary occlusion as evidenced by the depressed R T segments in lead I in his electrocardiogram. This condition was never fully relieved and he continued to have evidence of this coronary damage until his death. One important factor in the electrocardiogram was that the damage to the coronary circulation made little improvement and as time passed more evidence of disturbance in ventricular conduction developed as denoted by the spread of the Q R S complexes. This is an interesting case because the patient had typical Addison's disease complicated by a hypertension with all the symptoms of weakness, emaciation and diarrhea as well as nervous disturbance which progressed with periods of remissions and relapses until his death four years from the time I first saw him.

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#### BIBLIOGRAPHY

1. Meakins Practice of Medicine, 1936, p. 853.
2. Wigger's Physiology in Health and Disease, p. 1009.
3. Rogoff, J. M., and Stewart, G. N.: *Am. J. Physiol.* **84**:649 (April 28) 1928.
4. Pfiffner and Swingle: *Anat. Rec.* **44**:225, 1929.
5. Loeb, R. F.: *Proc. Soc. Exper. Biol. & Med.* **30**:808 (March) 1933.
6. *Proc. Staff Meet. Mayo Clin.* **15**:289 (March 8) 1940.

## MENISCUS CYST OF THE KNEE JOINT

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Bennett and Shaw (1936) mention Nicaise as having reported a case of meniscus cyst in 1883 although Ebner generally is credited with being the first to describe the condition in 1904. Ollerenshaw presented the first case in the English language in 1921. Phemister described two instances in the American literature in 1923. Up to 1933, Nicole collected one hundred twenty-seven cases from the world literature. McReynolds brought this total to two hundred fifty-seven in 1939. Four authors have studied ten or more of these lesions. Ollerenshaw personally accounted for forty-one cases in 1935. I wish to discuss nineteen additional cases of which ten have been observed personally, eight were supplied by Dr. A. Steindler and one by Dr. A. M. Allaman. The diagnosis was confirmed microscopically in eight instances and clinically in the remainder.

Accurate diagnosis is highly desirable in internal derangement of the knee joint from the standpoint of prognosis and treatment. Injuries of the internal (medial semilunar cartilage) meniscus, ligamentous structures and loose bodies have been appreciated generally. This has not been the case with meniscus cyst despite the fact that, among all conditions affecting the knee joint, meniscus cyst is unique because of its diagnostic certainty, if one is aware of the lesion. The condition had not been recognized previously in this series although symptoms had been present for from six months to nine years and averaged two and one half years. Familiarity with the distinctive clinical and pathological features of the lesion will dispel the confusion typically illustrated by the following case.

## REPORT OF CASE

A white male, aged 31, had complained of pain, localized swelling at the outer border of his right knee and functional disability of the affected joint for six months. The pain was dull aching in character and was intensified by weight bearing. The swelling remained constant in location but the pain varied in intensity at different intervals. Some relief was obtained by rest of the limb. The discomfort and functional disability recently had become progressively worse. The patient sought medical advice because he feared the swelling was due to cancer.

His physician noted a tense semisolid mass about the size of a hen's egg at the outer border of the right knee. The mass was tender only to deep digital pressure. There were no signs of inflammation or restriction of movement. The physician inferred that the lesion was neoplastic and had its origin from the upper outer border of the tibia. Biopsy was advised to determine the character of the supposed bony tumor.

At operative exposure an unexpected semifluctuant well encapsulated mass was encountered which was related complexly to the articular structures. Further anatomical orientation was uncertain. Incision of the mass revealed it to be filled with a clear gelatinous material. The extra-articular portion of the lesion was excised and its base curetted. The pathological report from frozen sections of the material removed was "not malignant." The wound was closed without drainage. Subsequent microscopic sections revealed typical cystic formation and fibrocartilage along one margin.

## INCIDENCE

Meniscus cyst of the knee is stated to be a disease essentially affecting the young. The majority of reported lesions occurred between the ages of 15 and 25 years; averaged 29 years and ranged between 5 and 58 years. Males were affected about four times more frequently than females. In this series the ratio of males to females was about 5:1. Their ages ranged between 13 years and 47 years and averaged 30 years. There were three patients in the second decade, five in the third, seven in the fourth and four in the fifth decade of life.

## DIAGNOSIS

The most common subjective symptoms of meniscus cyst are variable degrees of pain and localized swelling. In three of my cases the patients were unaware of the existing swellings. In five the discomfort varied directly with the variation in size of the swelling on different occasions. The pain is usually dull aching in character, persistent or intermittent. The pain is worse toward evening after a day's activity. It is usually absent in the morning only to recur with resumption of weight bearing. Sometimes the patient complains only of fatigability and a vague discomfort.

There is no definite history of "locking" of the joint in uncomplicated cases. When this symptom is prominent it should lead to the suspicion of other associated intra-articular lesions. A sensation of insecurity and "giving way" is not uncommon. Sensations of "popping" or tightness are noted occasionally. Rest or some type of support gives some relief of those symptoms which are due to secondary pressure on neighboring skeletal supportive

structures. The swelling, while varying in size at different periods, remains anatomically stationary.

Pain was a prominent symptom in approximately 90 per cent of the patients; the rest were conscious of more or less vague discomfort. The swelling varied in size at different intervals in two instances. In two cases the impression was that the swelling felt "tighter" at intervals. Three patients stated the affected joint occasionally "gave way." Two experienced a sensation of insecurity of the joint. One patient complained of both weakness and insecurity. Fatigability was the only functional complaint in one patient. Three patients had no functional incapacity whatever.

On physical examination the swelling is smooth, firm, tense, semifluctuant or rubbery in consistency. It is tender usually to ordinary digital pressure, occasionally only to firm palpation. The size varies from 1 by 1 cm. to that of a hen's egg. There are no signs of synovitis in uncomplicated cases. The range of motion is generally not affected. There is little or no atrophy of the calf or thigh musculature. A clicking or thud may be palpated or heard on auscultation during flexion and extension of the joint which is most intense over the affected area. The cardinal point in the objective diagnosis is practically pathognomonic and is the movement of the mass, with the tibia in flexion and extension, on the level with the joint line (fig. 1). The tumor is practically always most prominent on complete extension and recedes more or less on flexion.

The tumor mass in these cases was easily palpable in all but one instance. The mass was tender to digital pressure in thirteen instances, not tender in one and only moderately tender in four. Slight atrophy of the thigh musculature was present in three cases and slight functional restriction of motion in only two cases.

However, the differential diagnosis necessitates careful roentgen ray examination. The roentgenogram may reveal the enlargement when taken for soft tissue detail and substantiate the diagnosis by exclusion. Two cases have been reported in the literature in which there was secondary erosion of the tibia by cysts of the external cartilage. Exostosis from the upper, outer or inner margin of the tibia with overlying bursal formation may simulate meniscus cyst. One should exclude true out-pouchings of the synovial membrane. Tumors of the skin, subcutaneous tissues, ligaments, bone, cartilage, lymph, blood vessels and nerve elements might cause some doubt but they are rare in this region. A joint mouse or a thickened synovial tag might be responsible for a mass in this location. Discoid (congenital) menisci may simulate cyst subjectively and occasionally objectively.

## ASSOCIATED CONDITIONS

Practically all of the recorded cases in the literature were uncomplicated by associated lesions or conditions of a local or general character. Rheumatic fever and syphilis have been mentioned in



isolated instances. There have been no reported instances in arthritic patients and no associated neoplasms have been observed. Four cases presenting bilateral meniscus cysts have been studied. There has been reported one external and two medial meniscus cysts associated with fracture of the menisci.

In this series of cases several findings in this connection are worthy of mention. In a male patient aged 47 who had presented a medial meniscus cyst of nine months' duration a mild osteo-arthritis of both knees was found. Another male aged 30 with local symptoms of five years' duration stated that he had had frequent upper respiratory infections for some years. Two males aged 15 and 24 respectively exhibited moderate degrees of hypertension. The former showed signs of probable rheumatic heart disease. The latter harbored obviously active focal infections in the upper respiratory tract and prostate and had complained of scattered muscular and joint pains even before the onset of his local knee disability. A female aged 28 with meniscus symptoms of five years' duration stated that her local incapacity had always been intensified during her menstrual periods which were painful.

#### TREATMENT

The treatment which has been advocated includes aspiration, injection of sclerosing solutions, removal of the cyst with some adjacent cartilage and complete extirpation with removal of the entire affected cartilage. One case is mentioned in the literature in which there was spontaneous regression of symptoms. In another relief followed aspiration of the cyst contents. There is, however, unanimity of opinion with regard to radical extirpation. Anything short of this is temporizing and may result in recurrence as has been reported by several authors.

The infiltrative character of the lesion restricts opportunity for exposure; vulnerability of related

ligamentous structures and the possibility of associated lesions dictates adequate experience in knee joint surgery as well as a most meticulous aseptic technic. Cave (1935) described an excellent operative approach which is particularly useful in removing cysts of the menisci. This allows fair access to the anterior and posterior compartments of the knee joint on whichever side of the joint exposure is desired. As a rule a period of four to eight weeks will be necessary postoperatively before there is a return to normal function.

Seven of the cases reported here accepted radical surgical extirpation, five of which involved the lateral and one the medial meniscus. In two cases the immediate convalescence was troublesome due to postoperative joint reaction which required aspiration. There were no frank infections. The final results were excellent in all of those operated upon. Two cases, however, required a knee cage brace for a year because of some residual joint relaxation after operation. Unfortunately the case mentioned wherein the cyst alone was curetted was lost sight of. There was an apparent but doubtful spontaneous regression of symptoms in one of my unoperated cases.

#### PATHOLOGY

At operation the cysts are found grossly to be larger and softer than is expected from the physical examination. The capsule of the joint often is thinned by attrition or even herniated which may result in a parameniscal cyst. The cyst usually involves the lateral third of the external periphery of the meniscus (fig. 2) but occasionally originates from the posterior or anterior portions. In this series sixteen cysts arose from the lateral cartilage and three from the medial meniscus. Only one case has been reported which proceeded from the internal margin of the meniscus and extended directly into the joint cavity. The cyst is nodular and multilocular in structure and is situated on a broad base. On gross section of the tumor numerous cysts are noted. The largest are peripheral and filled with a clear gelatinous mucoid material. Microscopically this material is acid in reaction, hyaline or mucoid and the ground substance is nor-



Fig. 1. Photograph of knee showing the typical situation of the swelling representing a lateral meniscus cyst.

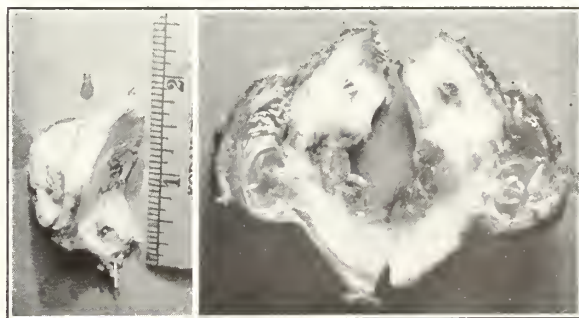


Fig. 2. Gross and horizontal section of a typical external meniscus and cyst of five years duration. Traumatic degenerative changes are noted involving the internal margin of the meniscus.

mal fibrocartilage. The cells lining the cyst wall are said to be found most characteristically in the swollen areas toward the meniscus itself (fig. 3).

#### PATHOGENESIS

It still is difficult to evaluate the part played by isolated or recurrent trauma in the development of these cysts. In a fairly large number of these cases there is no history of trauma. It is noteworthy that no cysts have been encountered among the many cartilages that are removed yearly for other reasons. Apparently severe trauma quite definitely has no relation to their development. The knee joint is subjected commonly to mild variable extrinsic and surely to marked intrinsic physiological traumata and yet the incidence of meniscus cysts is low. In those cases wherein the swelling was thought to have formed immediately after injury it is more likely that the trauma merely called attention to a preexisting condition. Thus one of my patients recently noted the typical mass immediately after bumping the side of his knee against a concrete wall. Further questioning however elicited the fact that he had been vaguely conscious of joint discomfort in this region over a period of years following a football injury sustained nine years previously. Direct trauma over a meniscus cyst may be expected to intensify or give rise to more prominent symptoms, previously unnoticed, from contusion, increased secretion or even possibly from hemorrhage about or into the cyst. It has been pointed out (Hosford) that in no other part of the body does a similar condition develop following trauma.

In this series of cases there was a history of antecedent trauma to the affected knee in ten instances. In three instances the injury was of a rather severe direct nature which had occurred remote from the onset of symptoms. In three the injury was insufficient to be recalled specifically as to nature and extent as well as with reference to the joint disability. Four patients had sustained various injuries during athletic contacts of an indirect nature which reasonably antedated the onset of complaints referable to the affected knee. There were no medico-legal problems involved in this series.

McReynolds summarizes the present generally accepted theories with regard to the etiology of meniscus cysts as follows: (1) They are secretory and allied to ganglia. (2) They represent mucoid degeneration which is related to some extent to previous trauma. (3) They are congenital in origin.

According to the older German view, these cysts are similar to ganglions that arise as the result of softening and colloid degeneration of para-articular tendinous or periosteal tissues about the knee owing to deficient nutrition following trauma. Taylor (1935) is of the opinion that cysts are due to progressive mucoid degeneration of the cartilage substance, from the center of which they have

been extruded. He believes cysts are the result of direct trauma which causes a contusion of meniscus. Geschickter and Copeland state that mucoid regression in precartilaginous tissue may occur in adult joint cartilages to form cysts and the same thing may occur in the tendon sheaths to form ganglia. The gross and microscopic findings in these two conditions are similar since they both arise from tissues which have their origin from mesenchyme.

King (1933 and 1939) maintains the secretory theory and also believes these cysts are analogous to ganglia. His histopathological studies indicate that the lining of the cystic spaces is a modified connective tissue like that of the synovial membrane. He states however that the mucoid areas are the result of secretion of certain cells rather than a degenerative process.

Ollerenshaw based his hypothesis of the congenital origin of meniscus cyst upon the apparently erroneous assumption that the cells lining the cyst walls are endothelial in origin. He believes that small endothelial nests, included in the cartilage during its development, begin to secrete, become distended and extrude peripherally following trauma. Chandler (1937) stated that the congenital hypothesis of the origin of meniscus cysts had not been substantiated by evidence of cystic formation associated with morphological abnormalities. However, Ollerenshaw, in reporting a cyst of the internal meniscus in one case, described the cartilage in this instance as broad in structure. Herzmark (1936) in reporting a case of bilateral giant (congenital) lateral menisci mentioned "mucoid degeneration" in one of them. Neither of these authors suggested any possible relationship between these two conditions.

In this series there were three cases presenting four congenitally malformed external menisci of which three were associated with cystic formation. I feel that one of these particular lesions helps to exclude the congenital theory of origin. In one, a boy aged 15, there was removed at operation a definitely enlarged "discoid" like meniscus and typical lateral cyst (fig. 4). A case of Steindler's presented what appeared to be on clinical examination bilateral external meniscus cysts. At operation there was found instead bilateral discoid external menisci with cystic changes on the right side.

In my last case neither the congenital malformation nor the cystic intrameniscal changes were suspected until after operative exposure and subsequent gross and microscopic sectioning of the cartilage. This patient, a male aged 33, gave a typical history of internal derangement presumably due to an injured lateral meniscus. The meniscus was found to be hypermobile and of a peculiar comma shaped conformity with the larger end anteriorly. Gross section through this latter region revealed small cystic areas.

Dr. William J. Hunt, St. Joseph, pathologist, reported his microscopic findings as follow:



Microsections show the tissue to consist of fibrous and fibrocartilagenous tissue in which one finds various cystic and degenerative changes. The pathological findings vary from an accumulation of a mucoid substance between the collagenous fibers to definite cystic and mucoid degeneration. The tissue shows an earlier phase of mucoid degeneration than is found in many such cases.

The first pathological evidence of tissue change is manifested by the faint blue stain taken by the tissue stroma instead of the usual pink stain (hemotoxylin and eosin). The collagenous fibers in such areas, although they are not swollen and the nuclei do not show degenerative changes, show a cleavage along parallel surfaces to form numerous slitlike spaces. These spaces are small and filled with a substance which takes a faint blue stain, thus producing the blue color described. Slitlike at first, these spaces become enlarged, oval or round and are surrounded by a fine fibrous membrane. This membrane also takes the hemotoxylin stain. As the cystic spaces enlarge the contained fluid becomes granular. From this stage the tissue change varies in different sections. These changes are as follows:

1. In the retention-cyst phase the cyst enlarges and the pressure from within produces a characteristic type of wall. These cyst walls are composed of rather dense, compressed fibrous tissue or fibrocartilage and are lined with a tissue containing elongated cells which have been described variously as connective tissue and as endothelium. The larger these cysts become the thicker the cyst wall appears to be. The contained fluid appears to be mucoid in character. Stroma cells are found throughout the fibrous wall; these cells are compressed and of long, spindle type and contain definite droplets.

2. In the degenerative phase slight to marked degenerative changes of mucoid nature are found. Here are cysts of varying size in close connection with each other; adjacent cysts have become continuous in some areas as manifested by the presence of fragmented and degenerated remains of septa. The cyst walls are very thin and show no evidence of lining endothelial cells. Many walls have ruptured and the mucoid substance is found infiltrating the adjacent stroma for some distance. Some of these degenerated areas have a reticulated appearance, the meshes of which contain the blue mucoid substance. The surrounding tissue gradually merges into these reticular areas without any evidence of any kind of cyst wall. Degenerative changes in stroma cells are found in such areas.

Many of the large cysts have one or more degenerative zones partially or completely surrounding the mother cyst. Here one sees many small smooth lined

spaces filled with mucoid substance. These spaces parallel the lining of the cyst wall. The contained fluid is granular in appearance.

A few multilocular cysts were found, the walls of which contained thin, dense, layers of connective tissue. Thin septa partition such cysts. Some of the larger loculi were lined by a fairly thick layer of young cellular connective tissue. No definite cell lining was found.

The blood vessel walls were but slightly thickened throughout the tissue and inflammatory changes were evident only in a few scattered areas.

#### HISTOLOGICAL SUMMARY AND INTERPRETATION (HUNT)

The tissue changes appear to have resulted from an exaggeration of secretion with resulting degenerative and cystic changes. The original accumulation of fluid appears to be the result of an exaggeration of secretion rather than to definite degenerative changes because the stroma cells in these areas show well formed nuclei and the cytoplasm contains a few to many well marked droplets. Similar droplets are present normally in the cells of the synovial membrane. Again in some of the cyst walls these cells appear to show a restoration to their original state. Some of the thick walled cysts appear to have resulted from this hypersecretion of fluid.

No definite evidence of endothelial lining was found in any of the cysts. The cells present in our microsections appear to be of the connective tissue type as only a few of the cells appear to line the cyst wall. Most of the cyst walls, however, fail to show any type of lining cell.

Other areas appear to show definite evidence of mucoid degeneration. The collagenous fibers are swollen or necrotic and the stroma cells show all stages of degeneration. Much of the degeneration appears to have resulted from rupture of cyst walls and infiltration of adjacent tissue.

Pathological diagnosis is semilunar cartilage cysts.

#### CONCLUSIONS

1. Nineteen cases of meniscus cyst of the knee joint are presented and analyzed as to incidence, diagnosis and treatment.

2. The relationship of trauma as a possible etiological factor is discussed briefly.

3. Three cases of congenitally malformed menisci which were associated with cystic changes are reported.

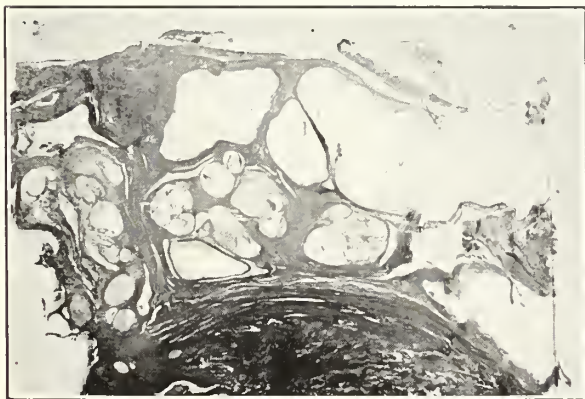


Fig. 3. Low power photomicrograph of horizontal section of affected meniscus showing large and small peripheral cysts and evidences of a similar nature originating in the substance of the meniscus itself.

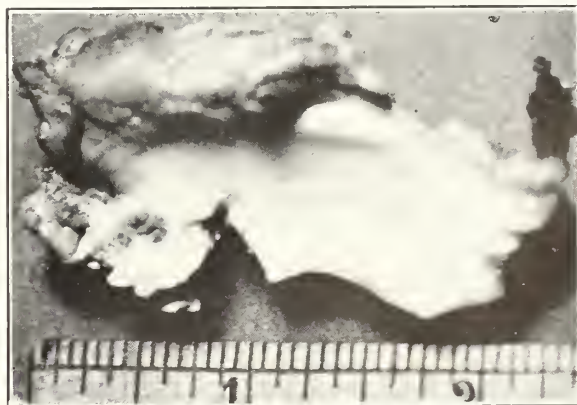


Fig. 4. Photograph of giant type of external meniscus with partially collapsed cyst arising from a broad base occupying almost two thirds of its anterolateral peripheral margin.

4. A detailed histological study is reported in an instance of congenital malformation which indicates that the primary origin of meniscus cyst is secretory and that degenerative changes are secondary, thus refuting the congenital theory of their development.

321 Kirkpatrick Building.

## CASE REPORT

### MIGRAINE

REPORT OF A CASE RELIEVED BY HISTAMINASE  
(TORANTIL)

J. R. NAKADA, M.D.  
ST. LOUIS

During recent years considerable work has been done to ascertain the cause of the phenomena exhibited by some of the so-called allergic diseases. Horton, Brown and Roth have studied the result of symptoms of cold allergy and found them to be analogous to the symptoms produced by the intra-arterial administration of 0.5 milligrams of histamine. They further found that these symptoms were relieved by treatment with histaminase, known as Torantil.

Best and McHenry reported that histamine was destroyed in the body by an enzyme called histaminase. One unit of histaminase is capable of detoxifying 1 milligram of histamine hydrochloride in twenty-four hours at 37 C. They found that this enzyme was produced in the walls of the large and small intestines in considerable amounts and in lesser amounts in other organs.

The work of Horton, Brown and Roth was confirmed recently by Baker who reported two cases of cold allergy relieved rather dramatically by the administration of histaminase.

During the last year I reported seven cases of duodenal ulcer which were relieved promptly of symptoms by histaminase. A case of migraine was referred to me by Dr. J. M. McCaughan on January 11, 1940, which I am reporting.

#### CASE REPORT

Patient was a white female, aged 49, widow, bookkeeper by occupation. She stated that for the last thirty-three years, ever since the onset of her menses, she has had severe occipital and right temporal headaches which were accompanied by blockage of the right side of the nose on lying down. During this entire time she always had been nauseated and vomited occasionally, also had severe cramps until a hysterectomy three and one-half years previously for a fibroid. Up to that time her severe headaches had occurred every two to four weeks. About two years ago they began to occur almost every day. Empirin compound, whisky, paregoric in large amounts gave only partial relief. She had been taking theelin three times a week since October 1939. This relieved her nervousness and her fatigue but had no effect on her headaches. On December 23, 1939, she had a severe headache with vomiting and 0.5 cc. of ergotamine tartrate failed to relieve her symptoms in a half hour.

Her family history revealed that her mother died of apoplexy at 75 years of age but had suffered from migraine for a number of years. One sister and two brothers also suffered from migraine. Her past history revealed the usual childhood diseases and an appendectomy and hysterectomy three years previously. Her menstrual history revealed the onset at 16 years of age, fairly regular, scanty. Her marital history revealed that she married at 19 years of age and had one daughter who also has migraine.

Physical examination showed her to be a short, obese, white female, of the pituitary-ovarian type with suggestion of a mild hypothyroidism. Her pupils were equal, moderately contracted and otherwise normal. The nasal septum was deflected to the left, almost completely blocking the left nares. Her tonsils were cryptic. There was considerable crown and bridge work in her mouth. The tongue protruded in midline with fine tremor. The left lobe of the thyroid and isthmus were slightly enlarged but had no nodulations. Her heart and lungs were normal. Blood pressure was 164/100. The abdomen was obese with a midline scar from the umbilicus to the symphysis, otherwise normal. She had a fine tremor of the extended hands which were warm and dry. Biceps, triceps and radialis were equal and active. The knee jerks were equal and slightly exaggerated. Romberg was negative. Kahn test was negative. Basal metabolic rate was minus 2 per cent. Diagnosis was migraine.

*Treatment.*—Two units of histaminase were given intramuscularly and some relief was obtained in ten minutes with complete relief in twenty minutes. She was given 10 units of histaminase per os three times a day and 1 unit intramuscularly twice a week for five weeks, then 1 unit a week for five weeks after which she was given 1 unit every ten days. During January she had one moderate attack. During February she had one mild attack at the beginning of the month and has had no headaches since February 2. In the latter part of January she noticed that she could eat oranges which she had been unable to do for fifteen years. On June 19, 1940, she stated that she had had no indigestion for at least twelve weeks and was able to eat anything including cucumbers.

A second case, which has received partial relief, has been under treatment too short a time to report in full.

#### DISCUSSION

This case is reported because of its unusual interest. While this report was being prepared, Baker, in his report on the effect of histaminase in cold allergy, stated that he was intending to try it in migraine. This case suggests the possibility that migraine may be due to a reaction from an overproduction of histamine. At least further investigation seems to be warranted.

504 Humboldt Building.

The material for this investigation was furnished by the Department of Medical Research of the Winthrop Chemical Company, Inc.

#### BIBLIOGRAPHY

1. Best, C. H., and McHenry, E. W.: Histamine, *Physiol. Rev.* 11:371-477 (October) 1931.
2. Roth, Grace, and Horton, B. T.: Hypersensitiveness to Cold; Treatment With Histamine and Histaminase, *Proc. Staff Meet. Mayo Clin.* 12:129-34 (March 3) 1937.
3. Nakada, J. R.: Treatment of Duodenal Ulcer With Histaminase. Preliminary Report, *Rev. Gastroenterol.* 6:389-94 (September-October) 1939.
4. Baker, T. W.: Histaminase in the Treatment of Cold Allergy, *J. A. M. A.* 114:1059-1061 (March 23) 1940.



## SPECIAL ARTICLE

## PHARMACOLOGY IN MEDICAL SCHOOLS

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The teacher of pharmacology in a medical school has several problems to confront in order that the greatest needs of the students may be met, limited to some extent by time and equipment as a rule. Since the greater part of a class will become practicing physicians, efforts should be directed to serve the group so that they may make better doctors. The student should receive as broad a working knowledge as possible in the time allotted for pharmacology and be able to apply this knowledge of drugs when brought in contact with patients. The instructor must exert greater efforts to correlate actions on the drug mechanism and diseased conditions in which the use of the drug becomes necessary. This does not mean sacrificing fundamental drug actions on specific parts of the body; rather an ability to apply information gained concerning the action of the drug upon any specific case which presents certain symptoms that need correcting. This can be done in an intelligent manner by a method of rational therapeutics based on the specific action of the drug, for a particular part or parts, rather than a hit and miss or trial and error basis. As long as there is basis for the use of a drug dependent on a specific action or effect which needs to be corrected in the patient under treatment, then the physician is practicing good therapeutics. Clinically an apparently desirable therapeutic response may result from the use of a substance before the complete action of the drug on all parts of the body has been determined and some undesirable effect may manifest itself later which contraindicates further use. Thus it is imperative that all drugs should be tested thoroughly by competent pharmacologists before extensive use on the public.

In the past too often the medical student has considered the work done in pharmacology, and perhaps justly so, as something separate from clinical medicine. The gap has been too big to bridge at that particular period and time of training and, as a consequence, the tendency to forget most of this material results with little serious attempt to apply the knowledge or even think of such in problems concerning patients. One weak point has been getting across to the student the correlations of drug action and applications and the importance of this knowledge in the good treatment of patients in medical practice. The value is just as great for the surgeon as the medical man for care of the patient preoperatively and postoperatively is just as important as the operation. One method for closer cooperation between fundamentals and intelligent

rational therapeutics, for which the training was devised, has been the adoption of experiments very largely on mammals with a preponderance of experiments on animals as a whole, both by the standard type of direct blood pressure method and injection or instillation of drugs in the animal by various routes with or without anesthetics. Dogs are used as far as possible for these have been found the most satisfactory animals available in sufficient numbers in which one can observe qualitatively practically the same drug effects as if given to man. This allows the student to obtain first hand under experimental conditions the potentialities of which the drugs are capable. No attempt is made to remember the dog dose for there is no direct general correlation with the human dose as each specie of animals has its own particular drug tolerance. The effect of intentional overdose can be studied and the more appropriate methods of treatment compared. In therapeutics one sometimes gives an overdose unintentionally due to allergic type of reactions or hypersensitivity on the part of the patient for whom the average normal dose is too much or a reversal of the expected therapeutic response occurs. Morphine in large doses regularly produces excitement instead of sedation in cats and the same type of response occasionally occurs in humans, especially in women. The treatment of attempted suicide from drug overdose is an ever potential possibility which the doctor faces.

The use of mammals and the study of the animals as a whole permit the student to see and do so much more with drug action responses than is possible with frogs, which have been used so extensively in the past. Often a whole laboratory period of three hours or more was spent perfusing a frog heart which at best confirms only a few isolated facts. The experiment is perfectly good as far as it goes but the use of this type of experiment, on account of the limited time, means sacrificing many experiments which show so much more. The difficult technic required to get good results for some experiments given so overwhelms the student and consumes time that the desired result sought, the action of the drug on particular structures or organs, becomes of secondary importance. There are a limited number of experiments which may be performed by the student in the time allotted for pharmacology. When many essential drug actions are omitted in the laboratory due to poor choice in the selection of experiments, the student may acquire some of this information in a more or less hit and miss fashion in the clinic, but the pharmacological training has failed to provide a basis for judgment as to what constitutes good treatment or poor treatment with the drugs thus omitted. Experience with patients will broaden and extend pharmacological knowledge, especially if a firm foundation on drug action has been provided for the beginner and much better therapy can be expected to result. One should not attempt to make research pharmacologists out of students taking the regular scheduled

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medical course. Advanced courses and special problems in pharmacology are necessary for research training. My attention has been called many times to the weakness of correlations of the basic information on drug action by doctors who have been practicing for from a few to ten or fifteen years. They feel that many of the experiments required for the laboratory work in their training had no bearing at all in helping them to become more efficient practitioners. As a result of impracticality these experiments were promptly forgotten and considered simply "excess baggage" as one doctor expressed his viewpoint. The general idea implied a poor selection of experiments and a lack of correlation for basic drug actions with clinical conditions. One has an adequate number of experiments to select from demonstrating the action of various drugs regularly used which will illustrate and impress on the student their importance in clinical medicine and perhaps act as a stimulus for extending such knowledge. If the students are able to see clearly that the facts demonstrated in the experiments and supplemented by lecture have a bearing on the treatment of patients, then the interest shown in the course becomes much greater and of course significant from the teaching standpoint.

It has been found that four students make the most ideal group for working together on the larger blood pressure type of experiments for each one has direct contact with the work and all are kept busy. In dogs, as in humans, considerable variations of the individual reaction exists for a particular drug. For each significant experimental procedure, certain designated data are secured and recorded on one big table in their proper place by each group. The general average of all group data constitutes the value used as a basis for discussions and conclusions which, for the most part, represent average data on from seven to nine dogs. This method allows for direct observation of the considerable individual variations for animal reactions and gives some idea of the magnitude of such modifications. Also, the results of the general averages practically always conform as would be expected to the discussions given in textbooks. Respiration, pulse and blood pressure as affected by the various drugs and combination of drugs are studied especially in detail. The average group data is plotted on graph paper, similar to that usually kept on a patient's hospital chart, so one can see at a glance the effect of each maneuver on the vital activities. The instructor has definite data for which the student can be held responsible in examinations on laboratory work for they have used the average data of all groups in writing up the experiment and for plotting the graph. The old excuse, "It did not work that way on my animal," no longer holds. The student is required to know the general effect on respiration, pulse and blood pressure and such other information as may be pertinent to the drug under consideration as, in the case of diuretics, the

relative rates of excretion by the kidney for the different ones.

The Conferences on Therapy published by the *Journal of the American Medical Association* are most illuminating and illustrate what can be accomplished by closer cooperation between various departments. The departments of pharmacology and medicine of Cornell University Medical College are to be congratulated for this fine endeavor. So often the department of pharmacology has been looked upon by clinicians and surgeons as something almost entirely apart from the actual practice of medicine, mostly theoretical and not practical. Fortunately, however, this idea is fast disappearing at most medical schools and closer cooperation and coordination between various departments exist for the mutual benefit of all, most especially the students. Much more stress has been given to pharmacotherapy in several recently published textbooks of pharmacology and better correlations developed for the clinical applications than formerly. The practitioner uses the information acquired in medical training, not by courses but as a unit, a coordinated knowledge, and the medical school should make the greatest possible effort to send the student forth with the best possible preparation. The physician should be able to look back on the training in pharmacology as supplying basic information which may be supplemented constantly by scientific observation and experience rather than as a mental hurdle which can be forgotten as soon as over.

University of Missouri.

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"Excessive speed and lack of acquaintance with the hazards of the open road are responsible for most automobile accidents on rural highways," John H. Powers, M.D., Cooperstown, N. Y., states in *The Journal of the American Medical Association* for November 2. He says that during 1930-1939 inclusive 712 patients were treated for 2,891 injuries sustained in 492 automobile accidents in a rural area traversed by a transcontinental highway.

Such accidents occurred most frequently on summer weekends while driving straight ahead in open country on dry roads, in clear weather and during the hours of daylight. Accidents in which no collision occurred were most frequent; head-on collisions with other cars, with fixed objects, and with pedestrians were common. These four types of accidents accounted for 82.6 per cent of the total.

Males were involved twice as frequently as females. Serious injuries were common. Fractures comprised 22 per cent of the traumatic lesions; 26 per cent of the patients sustained concussion of the brain and 15 per cent were in shock. The head and neck were injured with twice the frequency of the trunk or either of the extremities. The accidents in which the car was in motion but no collision occurred were usually due to failure of the driver to make a turn when driving too fast on a road with which he was unfamiliar.

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Studies made on twenty-one persons, most of them professional men and their wives, showed little evidence that the drinking of moderate amounts of alcohol significantly affects the vision. Z. William Colson, M.D., Boston, reports in *The Journal of the American Medical Association* for November 2.



# THE JOURNAL

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DECEMBER, 1940

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## EDITORIALS

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### THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

### DIVISION OF MEDICAL SCIENCES ATTACKS PREPAREDNESS PROBLEM

The thoroughness with which science is meeting its responsibilities in connection with the problems involved in national preparedness is illustrated in the organizational setup and activities of the Division of Medical Sciences of the National Research Council, which are outlined in *The Journal of the American Medical Association* for November 9.

"The National Research Council is composed of nine major divisions," *The Journal* says, "of which the Division of Medical Sciences is one. These divisions are arranged in two groups, one comprising the main branches of science and the other foreign relations and educational relations. Each division, then, has a governing body consisting of representatives from the leading national scientific societies in that field and also certain members at large. The problems of medicine are dealt with almost entirely by the Division of Medical Sciences but there is close cooperation with the other branches of science.

"About the middle of May, requests reached the chairman of the Division of Medical Sciences from the Surgeon Generals of the Army and Navy asking that the division establish committees which should act in an advisory capacity to the two medical corps. These committees met a few days later and organized for the study of their specific problems.

"At these early meetings, so many problems relating to other branches of medicine and pertinent to military affairs were presented that it was quickly realized by the committee members and by the medical officers that it would be necessary to create additional committees covering the whole field of medicine. It was felt desirable that the general committee should function largely through subcommittees composed of technical experts.

"In the last war it was found that there was great difficulty in assigning physicians to their proper place in the services, since sufficient information was not available as to their capabilities and experience. To obviate this difficulty the committees of the National Research Council are working in close cooperation with the Committee on Medical Preparedness of the American Medical Association in assembling all data on those medical men who will either volunteer or who will be called, so that each man will be placed most effectively.

"The exigencies and special problems of military organization require that the medical man brought into the service from civilian practice be given special training. This problem has been considered by a number of the committees. It is hoped that the medical schools and hospitals throughout the country will give this type of training in short courses to those doctors already brought into the services and also to those who expect to be called."

Describing the origin of the National Research

Council. *The Journal* says that the National Academy of Sciences, its parent body, was established by President Lincoln in 1863, under a charter from Congress which provided that the Academy should, whenever called on, give advice to the government on "any subject of science or art." In 1916 the Academy created the National Research Council as its active agent in organizing the scientific resources of the country for war. In 1918 President Wilson issued an executive order requesting the National Academy of Sciences to perpetuate the National Research Council and outlining its duties. In addition to problems of defense it was to survey and stimulate research in the various sciences. The latter function has been its principal aim.

The various committees of the Division of Medical Sciences include the Committee on Chemotherapeutic and Other Agents, composed of subcommittees on Infectious Diseases, Venereal Diseases, Tropical Diseases and Surgical Infection, and the Committee on Transfusions with subcommittees on Blood Substitutes and Shock.

The Committee on Medicine has subcommittees on Cardiovascular Diseases, Tuberculosis, Metabolism, Medical Nutrition, Clinical Investigation and Therapeutics. The Committee on Medicine has been making a survey of laboratory procedures for military hospitals and has given advice on the Mobilization Regulations.

The Subcommittee on Medical Nutrition has made recommendations to the Quartermaster Corps of the Army and the Supply Corps of the Navy concerning the sufficiency of vitamins in rations. The nutritional needs of the whole population have been discussed and recommendations made for restoring vitamins to flour.

Among the subjects under consideration by the Subcommittee on Clinical Investigation are fatigue, altitude and barometric pressure studies, night blindness and dark adaptation, clothing for high and low temperatures, and gas poisoning.

The Committee on Surgery includes subcommittees on Anesthesia, Radiology and Wound Healing. The surgical specialties are organized under a coordinating committee which correlates the activities of the other groups. One of its chief tasks is the evaluation of specialist personnel. The subcommittees on the surgical specialties are on Neurosurgery, Faciomaxillary (pertaining to the face and upper jaw) and Plastic Surgery, Otolaryngology (ear and throat), Vascular (blood vessel), Injuries, Thoracic (chest) Surgery, Orthopedic Surgery, Physical Therapy, Urology, and Ophthalmology.

The Committee on Information, with its subcommittees on Publicity and Historical Records, and the Committee on Aviation Medicine complete the Division's setup. One other general committee is in process of organization, that on Neuropsychiatry.

The chairmen of the seven main committees constitute an effective committee under the chairman-

ship of Dr. Lewis H. Weed, representing the Division of Medical Sciences. Its province is largely confined to policy and budgetary matters and except in rare instances, it will not pass on scientific or technical recommendations.

### TUBERCULOSIS IN RECRUITS

In the near future the examination of thousands of draftees will begin. Much has been written concerning the apprehension of malingerers and a more thorough and careful search for hidden defects. Among hidden defects tuberculosis is of prime importance. In a paper delivered before the Mississippi Valley Tuberculosis Association, Dr. J. D. Adamson, Winnipeg, Canada, gave some of the results of Canadian recruit examinations.

In the World War 600,000 Canadians enlisted and 400,000 reached the war zone. Of these 50,000 were killed and 7,000 died of disease. Of the 7,000 who died of disease, 3,000 died of tuberculosis and since the war 8,500 pensioners have died of tuberculosis. Such statistics show the necessity of eliminating tuberculosis from the present army as much as possible.

Investigation showed that in many cases of active disease, even when the disease was known to exist, physical examination failed to reveal it. Physicians familiar with the World War remember that examiners could not pay much attention to history and had to hear tales to diagnose tuberculosis.

In Canada all recruits have chest roentgenograms made by various physicians at a flat rate of \$2.00. Any film showing any evidence of disease is referred to a consultation board. All recruits showing active, inactive or arrested disease and some showing gross calcifications are rejected.

It has been found that the number rejected can be estimated fairly well by multiplying the death rate of the community by twenty. If this figure holds good for the United States, it indicates that about 900 per 100,000 of the Missouri draftees will be excluded.

Although the roentgenographic examination of the chest is indispensable, it is necessary that a careful physical check-up be made as other disorders such as bronchitis and bronchiectasis might be present.

### FIFTY MILLION MESSENGERS

On November 25, 1940, fifty million messengers of health started on their way over Missouri postal routes. They are better known as 1940 Christmas Seals and this year the three colorful caroling children are especially appealing.

Beginning in 1907, Christmas Seals not only have fought the tuberculosis battle but also have been an indirect and in many cases a direct help in other health campaigns. This association of ideas makes this little seal an ambassador of health going into



every home, a reminder of the need for tuberculin testing, of child health education, of routine physical examinations, of the need for more hospital beds and many other health interests. This is the kind of educational work physicians should sponsor.

If physicians like this work, it must be encouraged by precept and example. The seals will not appear on letters unless they are purchased. They are distributed to every county in the state and committees of interested laymen in each county are promoting the sales. Many physicians lend a helping voice for addresses and radio speeches. In some communities the Woman's Auxiliary takes an active part in the campaign. Active cooperation and participation in this work demonstrate to the layman that physicians are actually public health minded and can practice what they preach. If physicians can do nothing else to help, they at least can buy and use these messengers of health.

During the month of December, every piece of mail from a physician's office should carry a Christmas seal, the symbol of health.

## NEWS NOTES

Dr. James R. McVay, Kansas City, has been elected president of the Frisco Surgical Society. The society will hold its 1941 meeting in Kansas City.

Dr. Morris Polsky, Kansas City, spoke at a meeting of the Kansas Golden Belt Medical Society at Minneapolis, Kansas, on October 10. His subject was "Diagnosis of Congenital Syphilis."

Drs. Brian Blades and Edward M. Kent, St. Louis, presented a paper on "Individual Ligation Technic in Pulmonary Lobectomy" at the meeting of the Trudeau Club of St. Louis on November 7.

Drs. D. O. Walthall and Richard L. Sutton, Jr., Kansas City, were guests of the Sedgwick County (Kansas) Medical Society at Wichita, Kansas, October 15. Dr. Walthall spoke on "Staphylococcic Infection; Antitoxin and Sulfathiazol Therapy" and Dr. Sutton on "Acne Vulgaris and Lipoid Metabolism, the Etiology and Therapy of Acne."

The midyear board meeting of the American Medical Women's Association will be held at the Hertzler Clinic, Halstead, Kansas, December 7. Dr. Irene A. Koenekke, Halstead, Kansas, will be hostess. There will be medical, neurological and surgical rounds in the morning followed by the board meeting in the afternoon. For those who stay over Sunday, arrangements have been made for visits to the Wichita hospitals. All medical women are welcome.

Dr. G. D. Royston, St. Louis, was elected president-elect of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons at the annual session of the society held in Excelsior Springs September 26. Dr. Royston served as vice president in 1929.

Dr. Hubert M. Parker, Kansas City, presented addresses before the Arkansas Medical Society at Little Rock, Arkansas, October 16 and 17. His subjects were "The Management of Symptoms of Patients Who Have Had Several Laparotomies" and "Indications and Contraindications for Calcium Therapy."

The Army Medical Library, Washington, D. C., requests that author's reprints be sent to the library. These reprints are placed in a special collection, catalogued by author, and form a ready bibliography of the work of any given writer and also serve as a valuable supplementary source of material when the volume of original publication is temporarily unavailable.

Scientific exhibits were presented at the International Medical Assembly of the Inter-State Post Graduate Medical Association of North America at Cleveland, October 14 to 18, by Drs. August A. Werner, John R. Smith, Bruce C. Martin, William B. Kountz, Louis H. Jorstad and R. B. H. Gradwohl, St. Louis. Dr. David P. Barr, St. Louis, presented a diagnostic clinic.

Dr. John F. Hardesty, St. Louis, has received the Robert Johnston prize for work on statistics on the causes of blindness in Missouri. The prize was established by the late Mr. Johnston in 1928 when he was president of the St. Louis Society for the Blind to increase interest in the prevention of blindness. Previously the prize has been awarded for essays and posters. Dr. Hardesty is medical director of the St. Louis Society for the Blind.

The Committee on Maternal Welfare and Infant Care of the Association is in position to obtain opportunity for physicians to do postgraduate study in obstetrics and gynecology at the University of Chicago through the Chicago Lying-In Hospital and the University of Iowa at the University Hospitals. Any physician interested in such study should write Dr. Ralph R. Wilson, 201 Plaza Theatre Building, Kansas City, chairman of the Committee on Maternal Welfare and Infant Care.

Dr. M. Pinson Neal, Columbia, was chosen president-elect of the Southern Medical Association at its meeting in Louisville, Kentucky, November 12 to 15. Dr. Neal will be installed as president at the 1941 session which will be held in St. Louis. Dr. Quitman U. Newell, St. Louis, who died November

4, was president-elect and would have been installed as president at the Louisville meeting. Dr. Paul H. Ringer, Asheville, North Carolina, was elected president to serve during the ensuing year. Dr. Alphonse McMahon, St. Louis, was elected chairman of the executive committee of the council. Other Missouri members who were elected to offices are Drs. C. Malone Stroud, St. Louis, chairman of the section on allergy; Grayson Carroll, St. Louis, chairman of the section on urology; A. H. Conrad, St. Louis, chairman of the section on dermatology and syphilology; W. K. McIntyre, St. Louis, secretary of the section on proctology; Jean V. Cooke, St. Louis, vice chairman of the section on pediatrics. Members of the Missouri State Medical Association who presented papers or scientific exhibits are Drs. W. Merritt Ketcham, Nelse F. Ockerblad, Richard Sutton, Jr., and A. Graham Asher, Kansas City; M. Pinson Neal, Columbia; John C. Whitehorn, Wendell G. Scott, Sherwood Moore, Edwin C. Ernst, John E. Hobbs, Richard Paddock, B. J. McMahon, Rogers Deakin, Oliver Abel, Walter J. Siebert, R. B. H. Gradwohl, French K. Hansel, Louis H. Jorstad, R. O. Muether, and August A. Werner, St. Louis.

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Nonofficial Remedies:

#### Abbott Laboratories

Bismo-Cymol, 60 cc. Bottle

Bismo-Cymol, 500 cc. Bottle

Ampoules Procaine Hydrochloride 1%, W/V, 1½ cc.

Ampoules Procaine Hydrochloride 1%—Epinephrine 1:50,000 Solution 2 cc.

Butyn Sulfate Tablets, 25 mg.

#### Cheplin Biological Laboratories

Cheplin's Solution of Sodium Cacodylate with Benzyl Alcohol, 0.05 Gm. (¾ grain), 30 cc. Vial; 0.2 Gm. (3 grains), 30 cc. Vial; 0.3 Gm. (5 grains), 30 cc. Vial; 0.5 Gm. (7½ grains), 30 cc. Vial; 0.065 Gm. (1 grain), 1 cc.

#### Endo Products, Inc.

Ampoules Mercury Succinimide, 0.01 Gm. (⅙ grain), 1 cc.

Ampoules Sodium Thiosulfate Solution 0.5 Gm. in 5 cc.

Ampoules Sodium Thiosulfate Solution 1.0 Gm. in 10 cc.

Tablets Sulfanilamide—Endo, 5 grains

Tablets Sulfanilamide—Endo, 7½ grains

#### The National Drug Co.

Parenteral Solution of Liver, 10 cc. Ampul Vials, 5 U. S. P. Injectable Units per cc.

Parenteral Solution of Liver, 10 cc. Ampul Vials, 10 U. S. P. Injectable Units per cc.

#### Parke, Davis & Co.

Capsules Sulfapyridine, 0.25 Gm. (3¾ grains)

Riedel de Haen, Inc.

Pernoston Sodium

Ampules Pernoston Sodium, 10%, 2 cc.

Smith-Dorsey Company

Phenobarbital Tablets 0.1 Gm. (1½ grains)

Tablets Aminophyllin 0.1 Gm. (1½ grains)

Frederick Stearns & Co.

Tablets Thiamine Hydrochloride, 5 mg.

Tablets Thiamine Hydrochloride, 10 mg.

E. R. Squibb & Sons

Solution Thiamine Chloride—Squibb, 5 cc. Vial, 100 mg. per cc.

Upjohn Company

Hypodermic Tablets Procaine Hydrochloride 0.05 Gm.

Hypodermic Tablets Procaine Hydrochloride 0.02 Gm. (⅓ grain) with Epinephrine 0.025 mg. (½<sub>500</sub> grain)

## ORGANIZATION ACTIVITIES

### ABSTRACT OF COUNCIL MINUTES

The Council of the Missouri State Medical Association met October 16 at the Muehlebach Hotel, Kansas City. Dr. Curtis H. Lohr, St. Louis, Chairman, presided. In attendance were Drs. A. S. Bristow, Princeton; H. B. Goodrich, Hannibal; Charles E. Fallet, DeSoto; William A. Bloom, Fayette; F. I. Wilson, Kansas City; H. L. Kerr, Crane; Eldon C. Bohrer, West Plains, and Curtis H. Lohr, St. Louis, Councilors; Cyrus E. Burford, St. Louis, President; R. B. Denny, Creve Coeur, President-Elect; E. H. Bartelsmeyer, Executive Secretary; Morris B. Simpson, Kansas City, Chairman, Committee on Public Policy, and R. M. James, Joplin, and Donald M. Dowell, Chillicothe, members of the Committee; Robert Mueller, St. Louis, State Chairman, Committee on Medical Preparedness; James E. Stowers, Kansas City, member, Committee on Medical Military Affairs, and James R. McVay, Kansas City, and F. K. Helsby, Kansas City, Executive Secretary, Jackson County Medical Society, guests.

The minutes of the meeting of the Council on May 1, 1940, were approved as published in *THE JOURNAL*, July 1940.

The Chairman reported that in accordance with the action of the Council on May 1, he had consulted the respective delegates representing the Fourth Councilor District and they unanimously had elected Dr. Charles E. Fallet, DeSoto, as Councilor of the Fourth District to fill the unexpired term of Dr. R. B. Denny, Creve Coeur, who resigned subsequent to his election as President-Elect.

The appointment of Dr. Charles E. Fallet, DeSoto, as a member of the General Committee on Arrangements for the St. Louis 1941 Annual Session was approved.

The President submitted the appointment of Dr. Robert Mueller, St. Louis, as the State Chairman



of the Committee on Medical Preparedness, which was confirmed.

The Secretary presented the report of the Treasurer, Dr. R. L. Thompson, St. Louis, which indicated a cash balance of \$12,335.05 as of October 14, 1940. The report of the Treasurer pointed out that post office regulations applying to the mailing of *THE JOURNAL* require payment of dues which include subscription to *THE JOURNAL* and that the names of delinquent members would have to be removed from the mailing list until the dues were paid. The Council authorized the Treasurer and the Editor of *THE JOURNAL* to notify delinquent members accordingly.

The Secretary reported that several county societies had requested information as to who shall pay dues for members in the Medical Reserve Corps who are called for duty. The decision of the Council with reference to this same question as of 1918 was reviewed by reading an excerpt from the minutes of the Council of May 6, 1918, in Annual Session at Jefferson City. The 1918 minutes read as follows:

"The Committee was asked to rule on the question of who shall pay the state assessment for members of county societies in the Medical Reserve Corps. The Committee decided it had no authority to rule on this question as it amounted to a suspension of the By-Law requiring annual payment of the state assessment, but recommended to the county societies that the societies pay out of the county society treasury the state assessment of their members in active service in the Medical Reserve Corps. Many societies have done this and many members of the Medical Reserve Corps have paid their county and state dues as usual. By corresponding with other state associations we have learned that county societies throughout the country are paying the state assessment of their members with few exceptions. It seems to the Committee that the burden of paying the state assessments would fall very lightly upon the individual societies but if the State Association undertook to bear the loss it would seriously embarrass the activities of the Association."

It was the opinion of the Council that the previous ruling should prevail in the present situation. It was agreed that county medical societies should consider each case on an individual basis and that if a member in active service in the Medical Reserve Corps was financially unable to pay his dues and the Society remitted his dues, the Council would remit the dues of the State Association upon the recommendation of the Society.

Dr. Robert Mueller, St. Louis, State Chairman of the Committee on Medical Preparedness, reported in detail the activity of his Committee. Each Councilor accepted the responsibility of acting as Chairman of the Committee on Medical Preparedness in his respective district.

Dr. Morris B. Simpson, Kansas City, Chairman

of the Committee on Public Policy, discussed the activity of that Committee. It was decided to hold a joint meeting of the Councilors and presidents and secretaries of the component county medical societies at as early a date as might be deemed expedient, the President and the Chairman of the Council to call the meeting.

The Council was the guest of the Jackson County Medical Society for lunch.

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## DEATHS

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**Butler, Thomas R., M.D.**, Lexington, graduate of the Bellevue Hospital Medical College, New York, 1885; honor member of the Lafayette County Medical Society and former president and delegate; aged 78; died July 4.

**Harris, Hilborn W., M.D.**, Canton, graduate of the Missouri Medical College, St. Louis, 1888; honor member of the Lewis-Clark-Scotland County Medical Society; aged 76; died August 12.

**Sherer, Joseph W., M.D.**, Kansas City, graduate of the State University of Iowa College of Medicine, Iowa City, 1894; honor member of the Jackson County Medical Society; Fellow of the American Medical Association; aged 71; died August 17.

**Murphy, R. Brent, M.D.**, St. Louis, graduate of Washington University School of Medicine, 1889; Fellow of the American Medical Association; honor member of the St. Louis Medical Society; aged 73; died September 26.

**Van Ravenswaay, Cornelius H., M.D.**, Boonville; Fellow of the American Medical Association; member of the Cooper County Medical Society; president of Society in 1930; delegate to several Annual Sessions; aged 69; died September 29.

**Clark, Hiram J., M.D.**, Excelsior Springs, graduate of Washington University School of Medicine, St. Louis, 1907; member of the Clay County Medical Society; aged 73; died October 2.

**Shotwell, Charles B., M.D.**, Richmond, graduate of Rush Medical College, Chicago, 1883; honor member of the Ray County Medical Society; aged 83; died October 12.

**Newell, Quitman U., M.D.**, St. Louis, graduate of the University of Alabama School of Medicine, Mobile, 1911; Fellow of the American Medical Association; member of American Board of Obstetrics and Gynecology; member of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, the Southern Surgical Association, the Central Association of Obstetricians and Gynecologists and the American College of Surgeons and president-Elect of the Southern Medical Association; Professor of Clinical Obstetrics and Gynecology at Washington University School of Medicine; aged 54; died November 4.

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## TWO PHYSICIANS EMPHASIZE RISK OF GOLD SALTS FOR ARTHRITIS

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The danger of gold salt treatment for arthritis is emphasized in *The Journal of the American Medical Association* for November 9 by Norman LaRue Anderson, M.D., and Walter Lincoln Palmer, M.D., Chicago.

"Clinical and experimental evidence in the literature," they state, "indicates that mild, severe or fatal reactions occur in a significant percentage of cases so treated; there is no specific antidote or treatment for these reactions."

"The use of gold salt therapy should be accompanied by full recognition of the many dangers involved."

## COUNCILOR DISTRICT AND SOCIETY PROCEEDINGS

### COUNTY SOCIETY HONOR ROLL 1940

(SOCIETIES WHICH HAVE PAID DUES FOR ALL MEMBERS AND DATE PLACED ON HONOR ROLL)

#### HONOR ROLL

Chariton County, December 5, 1939.  
Perry County, December 11, 1939.  
Camden County, December 18, 1939.  
Miller County, December 20, 1939.  
Ste. Genevieve County, December 22, 1939.  
Clinton County, December 23, 1939.  
Moniteau County, January 8, 1940.  
Macon County, January 10, 1940.  
Dent County, January 29, 1940.  
Dallas-Hickory-Polk Counties, February 15, 1940.  
Barry County, February 22, 1940.  
Audrain County, March 22, 1940.  
Webster County, March 25, 1940.  
Morgan County, April 8, 1940.  
DeKalb County, April 15, 1940.  
Newton County, April 15, 1940.  
Howard County, April 16, 1940.  
Lincoln County, April 26, 1940.  
St. Francois-Iron-Madison-Washington-Reynolds Counties, May 2, 1940.  
Adair-Schuyler-Knox-Sullivan-Putnam Counties, May 16, 1940.  
Bates County, May 24, 1940.  
Benton County, July 6, 1940.  
Holt County, July 8, 1940.  
Pulaski County, July 8, 1940.  
Franklin County, July 9, 1940.  
Phelps-Crawford Counties, July 12, 1940.  
Carroll County, July 18, 1940.  
Christian County, July 19, 1940.  
Carter-Shannon Counties, September 3, 1940.  
Mercer County, September 27, 1940.  
Henry County, September 28, 1940.  
Pettis County, October 10, 1940.  
Greene County, November 12, 1940.

ASSOCIATE EDITORS: COUNCILORS OF THE  
TEN COUNCILOR DISTRICTS

#### SIXTH COUNCILOR DISTRICT

A. J. CAMPBELL, SEDALIA, COUNCILOR

##### Henry County Medical Society

The Henry County Medical Society met at the Clinton General Hospital, Clinton, October 25.

Members present were Drs. R. A. Blackmore and R. J. Jennings, Windsor; J. O. Smith, R. S. Hollingsworth, G. S. Walker, S. B. Hughes and E. C. Peelor, Clinton.

Mr. W. F. Dean, Springfield, spoke on Group Hospital Service, Inc., which was discussed at considerable length.

E. C. PEELOR, M.D., Secretary.

#### NINTH COUNCILOR DISTRICT

ELDON C. BOHRER, WEST PLAINS, COUNCILOR

##### South Central Counties Medical Society

The South Central Counties Medical Society met at the El Patio Hotel, Cabool, October 10.

Members and guests present were Drs. Eldon C. Bohrer, West Plains; J. A. Fuson, Mansfield; L. T. Van Noy, Norwood; A. C. Ames, R. W. Denney, H. G. Frame and R. A. Ryan, Mountain Grove; J. R. Womack, Houston; Garrett Hogg, Jr., Cabool; Fred R. Farthing and E. E. Glenn, Springfield, and C. F. Callihan, Willow Springs.

Dr. Fred R. Farthing, Springfield, presented a paper on "Uterine Bleeding, Diagnosis and Treatment."

Dr. E. E. Glenn, Springfield, read a paper on "Angina Pectoris and Coronary Disease."

Following a general discussion of the papers, a short business meeting was held.

C. F. CALLIHAN, M.D., Secretary.

#### TENTH COUNCILOR DISTRICT

ELAM J. NIENSTEDT, SIKESTON, COUNCILOR

##### Cape Girardeau County Medical Society

The Cape Girardeau County Medical Society met on November 11 for a dinner meeting at the Colonial Tavern, Cape Girardeau. Dr. Walter Baumgarten, St. Louis, was guest speaker.

Members and guests present were Drs. C. T. Herbert, Cape Girardeau, presiding; Leonard Peal and Harry Phillips, Anna, Illinois; W. L. Digges, New Madrid; W. E. Urban, W. H. Bailey and W. H. Barks, Perryville; W. H. Barron, S. C. Slaughter, Fredericktown; Edward Crites, Sedgewickville; D. I. L. Seabaugh, Jackson; W. F. Oehler, W. E. Yount, W. H. Wescoat, M. H. Shelby, O. L. Seabaugh, Victor H. Karpas, Frank W. Hall, George W. Walker, Glenn J. Tygett, J. H. Cochran and C. A. W. Zimmermann, Cape Girardeau.

The secretary presented a letter from Dr. W. T. Lewis, Herrin, Illinois, inviting members to attend the meeting of the Southern Illinois Medical Association at Metropolis, Illinois, on November 14.

An application for membership of Dr. Victor H. Karpas was referred to the board of censors.

The entertainment committee called attention to next month's program which is to consist of election of officers followed by a social evening.

Dr. Walter Baumgarten, St. Louis, read a paper on "Coronary Heart Disease." The subject was presented in an interesting and accurately scientific manner and was followed by much discussion and numerous questions.

C. A. W. ZIMMERMANN, M.D., Secretary.

##### St. Francois-Iron-Madison-Washington-Reynolds County Medical Society

The St. Francois-Iron-Madison-Washington-Reynolds County Medical Society met at the St. Francois County Courthouse, Farmington, October 25 at 7:30 p. m.

Dr. Leo Hartnett, St. Louis, spoke on "Postpartum Hemorrhage." A motion picture of the treatment of postpartum hemorrhage was shown. A lengthy and interesting discussion followed.

A letter from the National Physicians' Committee was read concerning the progress the committee had made in the last eleven months in suppressing the attempted socialization of medicine.

Members present were Drs. C. H. Appleberry and Paul L. Jones, Flat River; Reuben Appleberry, F. R. Crouch, G. Tivis Graves, N. W. Hawkins, Emmett F. Hoctor, Ralph Kuhlman and G. L. Watkins, Farming-



ton; W. H. Barron, Fredericktown; Marvin T. Haw, David E. Smith and Van W. Taylor, Bonne Terre; Harold C. Gaebe, Desloge; R. E. Harland, Ironton; J. W. Hunt, Leadwood; J. L. Thurman, Potosi, and J. P. Yeargain, Irondale.

G. TIVIS GRAVES, M.D., Secretary.

## BOOKS FOR LEISURE MOMENTS

### THE TEACHING OF LIVING

"Teaching Wholesome Living" (A. S. Barnes Co., New York) is the sincere effort of Miss Alma A. Dobbs of the Los Angeles city schools to construct a syllabus for instruction in this important subject. As a first effort it succeeds fairly well. In spots the thinking is puritanic; in other spots, modern and well adapted to the needs of the day. The philosophic observations having to do with the child are well taken and embrace a more modern point of view than some of the didactic material. The volume aims to teach by doing and practice rather than by precept. It may prove an advantageous addition, despite some short-comings, to the library of physician or teacher concerned with the child and his problems.

B. Y. G.

### SCIENCE SIMPLIFIED

J. B. S. Haldane, professor of biometry in the University of London, is known as a communist. Perhaps an instinctive reaction, therefore, is to shun his writings. He is also a scientist of considerable renown and high rank. Perhaps an instinctive reaction thereto is to shun his writings for fear of abstruseness. However, he possesses the unique talent of simplifying the abstruse so that the common man may learn of it. It is possible that his eternal concern with the lot of the common man and his steadfast conviction that science is for the common man instead of the industrial capitalist has developed within him this rare capacity.

In "Science and Everyday Life" (Macmillan, New York) Haldane's intellectual peregrinations touch such diverse subjects as food, nature's speed limits, the economics of cancer, painkillers, the physical basis of heredity, colliery explosions and the composition of the universe. He is never unmindful of his audience and spares no effort to carry the reader out of his mundane existence into the wherewithal of a host of scientific intricacies. For example, he makes the reason that bananas have no seeds the subject of an extensive socioeconomic discourse and the strange case of Rahman Bey a discursive commentary upon the gullibility of human beings and their need for scientific knowledge.

B. Y. G.

### THE MEANING OF NUMBERS

Every physician will understand the first half of "Medical Biometrics and Statistics" (W. B. Saunders Co., Philadelphia) by Raymond Pearl, professor of biology at the Johns Hopkins University. A few of them will understand the last third. All of them will gain a new appreciation of statistics and their reliability from reading the volume. To put it another way, they will learn how liars and figures may lie.

The incidence of a particular disease is not of necessity represented by the fraction composed of the number of cases over susceptible population. A table makes it clear that if a sampled group consists of fifty persons, of whom twenty have the disease in question, the incidence of that disease may vary between 24 and 58 per cent. Only when the sampled group becomes sufficiently large, after having been selected according to rigidly defined criteria, may it be concluded that a particular

incidence exists. Perusal of the volume makes the disastrous failure of numerous straw polls to predict the result of the presidential election abundantly clear.

Among the more noteworthy studies of the author and his associates is that concerned with a determination of the health status of the 50,000 residents in one Baltimore district. Let no physician delude himself into the belief that because the volume is concerned with statistics he will learn nothing from it. He will learn much.

B. Y. G.

## BOOK REVIEWS

REGIONAL DIAGNOSIS IN LESIONS OF THE BRAIN AND SPINAL CORD. By Robert Bing. Translated and edited by Webb Haymaker. St. Louis: The C. V. Mosby Company. 1940.

This work by the well known Swiss neurologist is elementary and didactic in its treatment and evidently is intended for students. The matter is presented without discussion and without reference and hence no idea is given of the tentative and complex nature of many of the conceptions. Much material is omitted altogether. There is a great deal of instructive material, the style is clear and format excellent. As an introductory work, the book can be recommended.

L. B. A.

SYNOPSIS OF OBSTETRICS. By Jennings C. Litzenberg, M.D., F.A.C.S., Professor Emeritus of Obstetrics and Gynecology, University of Minnesota Medical School, Minneapolis. With 157 illustrations, including five in color. St. Louis: The C. V. Mosby Company. 1940. Price \$4.50.

This is an up to the minute concise synopsis of obstetrics. The illustrations are clear and are unusually fine for a book of its size.

The chapters on contracted pelvis and premature separation of the placenta are exceptionally good. For the student who does not have the time or means to use the larger treatises, this book most certainly is recommended.

R. B.

A TEXTBOOK OF MEDICINE. By American Authors. Edited by Russell L. Cecil, A.B., M.D., Sc.D., Professor of Clinical Medicine, Cornell University Medical College, etc. Associate Editor for Diseases of the Nervous System, Foster Kennedy, M.D., F.R.S.E., Professor of Clinical Neurology, Cornell University Medical College, etc. Fifth edition, revised and entirely reset. Illustrated. Philadelphia and London: W. B. Saunders Company. 1940.

With a list of contributors that reads like a Who's Who in American medicine, the fifth edition of Cecil's "A Textbook of Medicine" has just come from the presses.

The format is similar to the previous editions but much of the material has been rewritten and some new subjects have been added. "The present edition contains a number of entirely new articles on subjects not covered in previous editions: Equine Encephalomyelitis, Moniliasis, Toxoplasmosis, Disseminated Lupus Erythematosus, Chronic Bromide Poisoning, Riboflavin Deficiency, Uveoparotid Fever, Regional Ileitis, Amaurotic Family Idiocy, Gargoylism."

Considering the large number of contributors, the writing is surprisingly even and of high quality. A virtual encyclopedia of modern medicine, this text deserves first place in the medicine section of the library of every practicing physician.

B. S. P.

### TELLS HOW TO AVOID HUGE COSTS OF TUBERCULOSIS CARE IN ARMY

In order to avoid a repetition of the huge costs unnecessarily incurred in the first World War for the care of tuberculosis cases in our Army, x-ray pictures of the chest showing absence of tuberculosis infection should be the criterion for acceptance in the event of mobilization for war today, and they should be made and reported when the candidate is first examined, "before he has spent a night away from his own roof," Ramsay Spillman, M.D., New York, maintains in *The Journal of the American Medical Association* for October 19.

"Tuberculosis during and after the World War has cost approximately \$860,000,000 to date in compensation, vocational training and insurance," he declares. "This is entirely aside from the cost of constructing and maintaining hospitals for tuberculosis and providing them with medical staffs." He sets this figure at \$100,000,000.

Much of this cost was incurred because of failure to detect evidence of the disease soon enough in drafted men. The expense of taking one man with tuberculosis into the army, Dr. Spillman estimates, is probably around \$10,000, certainly not less than \$7,500, a figure to which can be added at least \$50 a month for the rest of the man's life and compensation benefits for his dependents after his death.

In the World War men were accepted for training who passed a personal physical examination without evidence of tuberculosis. Physical diagnosis has been shown by evidence, much of which has accumulated since the War, to be much less reliable than radiography (the taking of x-ray pictures). While the expense of radiography was considered too high to be practical at the time of the War, its proved advantages over physical examination make its cost negligible in comparison with the saving it would effect. Furthermore, the shortage of x-ray specialists which made routine radiography impracticable at the time of the War no longer exists.

Discussing the huge amount of compensation paid out to men manifestly tuberculous at the time they were sent to camp, Dr. Spillman points out that in 1917 local draft boards were supposed to reject draftees with disqualifying defects before sending the candidates to army camps. Yet in the reexamination of men sent to camps, large numbers were found by chest experts to be tuberculous. Some of these men had been sent by the local draft boards on the assumption that a change of climate would benefit their tuberculosis!

At camp the recruits were given injections of typhoid vaccine, which in a great many cases resulted in a sore arm. Soon afterward they were examined for tuberculosis. Many of those rejected because of tuberculosis had not known until then that they had the disease. "By the simplest association of ideas," the author points out, "many of them believed that what made the arm sore was responsible for the tuberculosis. But whether they first learned that they had tuberculosis, with or without the belief that it was the 'T. P. shot' that produced it, or whether they had come to the cantonment for the change of climate on the prescription of the draft board physician, every one of these rejectees was able to present evidence, acceptable under the law, that dictated the course of the War Risk Insurance rating doctors, of whom I was one, that their tuberculosis had been aggravated by their few days at camp, and they went on the payroll from that time on for the aggravation of the preexisting disease, just the same as if they had incurred it at camp."

To avoid a repetition of this situation, Dr. Spillman recommends that the x-ray picture "should be made and reported before the recruit has spent a night away from his own roof."

He declares that examination of the chest with the fluoroscope, an x-ray machine which shows on a screen the lungs and heart in action as contrasted with

the still view which is provided by an x-ray film, is entirely unsatisfactory as a substitute for radiography. "Fluoroscopy gives no permanent record, it is highly subjective and it introduces the personal equation," he says.

The author points out that while his paper emphasizes the financial cost of taking tuberculous men into the army, there are other disadvantages, such as the tendency of strenuous exertion to activate latent tuberculosis and the infection of adults in close contact with tuberculous persons, a concept not understood in 1917.

### SAYS AN ADEQUATE NATIONAL DEFENSE NEEDS A VIGOROUS HEALTH OFFENSE

"An adequate national defense requires a vigorous health offense," Everett D. Bristol, M.D., New York, declares in *The Journal of the American Medical Association* for October 12 in a paper in which he points out that the needs of national defense require a strengthening and broadening of the entire industrial health program all along the line from private industry to local, state and federal jurisdictions.

In discussing the industrial health problems involved in preparedness, Dr. Bristol says: "The speed-up of industrial production and manufacture, the development of new material and methods, the increased employment of new workers unused to the hazards of industry will require new industrial health routines and regulations, more intensive study and research in the field of occupational diseases and industrial poisons and the extension and improvement of all health and safety education."

"Reducing lost time due to occupational and non-occupational illness and accidents and cutting down excessive exposure to injurious materials are part of the industrial health program which will be conducive to maximum national effectiveness and production. It is particularly necessary that studies be made to determine unfavorable environmental factors in the production of war equipment and munitions."

"The business employer or the governmental unit that considers reducing its industrial health program at this time, because of what at the moment may seem to be more important activities, is most unwise."

Physical examinations are of first importance in both military and industrial medicine. Their object is not to keep people out of work but to place them where they will remain the healthiest and consequently do the most good. Mental hygiene plays a major role.

"The possible availability of properly qualified full time industrial physicians and surgeons for special assignments in the federal service," the author says, "should be given careful attention while at the same time acknowledging the fact that as a group the greatest usefulness of trained industrial physicians may be in their remaining at their posts in private industry."

### EXPOSURE TO LOW OXYGEN ENVIRONMENTS

The possibility that repeated exposures to environments low in oxygen, such as encountered by aviators flying at high altitudes, may damage the nerve cells of the brain and gradually lower the brain's reserve power, leading eventually to mental conditions comparable to those of the "punch-drunk" boxer, is suggested by investigations reported in *The Journal of the American Medical Association* for November 9 by Melvin W. Thorner, M.D., Randolph Field, Texas, and F. H. Lewy, M.D., Philadelphia.

Their studies show that exposures to total lack of oxygen for periods too short to cause death lead to degenerative changes in the brains of guinea pigs and cats.



# THE JOURNAL

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## USE OF SULFAPYRIDINE COMBATS FRIEDLANDER TYPE OF PNEUMONIA

The first reported use of sulfapyridine for chronic pneumonia due to the Friedländer bacillus brought about the recovery of the four cases in which it was used, Saul Solomon, M.D., New York, declares in *The Journal of the American Medical Association* for November 2.

The more common type of pneumonia is caused by the pneumococcus, a berry-shaped organism, whereas the Friedländer bacillus, named after its discoverer, a German pathologist, is rod-shaped and is responsible for from 1 to 3 per cent of all adult cases of acute pneumonia. Dr. Solomon points out that an estimation of the incidence of the chronic type of Friedländer pneumonia is difficult to make but it is less than that of the acute type. "It is probable, however," he says, "that the disease is more common than is generally supposed since this condition is frequently mistaken for other chronic lung diseases.

"Chronic Friedländer pneumonia occurs chiefly in the later decades of life. No case has yet been observed in childhood. The disease is more frequent in males."

He reports seventeen chronic cases. Four of them were given sulfapyridine and one, who was bacteremic (had bacteria in the blood stream), was given sulfanilamide. All five recovered. Among the other twelve patients, who were given other treatment, there were four deaths.

The acute form of Friedländer pneumonia, he points out, usually ends fatally within four weeks. However, those patients who survive the acute phase pass into the chronic stage, which has a relatively mild course over months or years.

In evaluating the effectiveness of sulfapyridine in these cases, the author says: "It would appear that the drug was most useful in permitting survival during the acute stage. There was, however, little other evident effect on the clinical course, since in three of the cases during the course of therapy (treatment) suppuration (discharge of pus) and abscess formation occurred. In the fourth, this process was already well established when treatment was begun. While the results with sulfapyridine are still inconclusive, one should, nevertheless, for the present accept the remedy as the most promising yet advanced for the treatment of this disease."

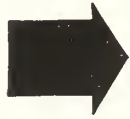
Dr. Solomon says the chronic infection can easily be confused with putrid lung abscess, chronic lung tuberculosis or cancer of the bronchus (windpipe), and the bacillus is often found in association with other lung infections. Cultures of sputum will prove or disprove the diagnosis.

In discussing the extent of the chronic phase of the disease he says that it may persist indefinitely with increases in severity and remissions. In his cases, he says, the disease lasted anywhere from one month to more than three years as far as could be determined. "Moreover," he observes, "there were individuals who recovered and were discharged with incomplete clearing of the lungs only to be readmitted after a lapse of months with a recurrence or an exacerbation of the disease. Patients who have recovered from acute Friedländer pneumonia should not be dismissed from observation too soon because of the strong possibility of the development of chronic lung changes.

"Only four of the seventeen patients in this series died, a mortality of 23.5 per cent as compared with 97 per cent in the acute group. However, these statistics are not final since several patients have not returned for observation after leaving the hospital. Four of the patients have not yet been discharged, though it appears likely that they will recover. Five others have returned to their usual mode of life and are followed at intervals in the clinic."



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## BOOKS RECEIVED

**THE 1940 YEAR BOOK OF PUBLIC HEALTH.** Edited by J. C. Geiger, M.D., Dr.P.H., Director of Public Health, City and County of San Francisco; Clinical Professor of Epidemiology, University of California. Chicago: The Year Book Publishers, Inc. 1940. Price \$3.00.

**NEW AND NONOFFICIAL REMEDIES.** Containing Descriptions of the Articles Which Stand Accepted by the Council on Pharmacy and Chemistry of the American Medical Association on January 1, 1940. Chicago: American Medical Association.

**THE INTERNATIONAL MEDICAL ANNUAL.** A Year Book of Treatment and Practitioner's Index. Editors: H. Lethby Tidy, M.A., M.D. (Oxon.), F.R.C.P., and A. Rendle Short, M.D., B.S., B.Sc., F.R.C.S. Fifty-eighth year. Baltimore: The Williams and Wilkins Company. 1940. Price \$6.00.

**THE PRACTICE OF MEDICINE.** By Jonathan Campbell Meakins, M.D., LL.D., Professor of Medicine and Director of the Department of Medicine, McGill University; Physician-in-Chief, Royal Victoria Hospital, Montreal, etc. Third edition. With 562 illustrations including forty-eight in color. St. Louis: The C. V. Mosby Company. 1940. Price \$10.00.

**OFFICE UROLOGY WITH A SECTION ON CYSTOSCOPY.** By P. S. Pelouze, M.D., Assistant Professor of Urology, University of Pennsylvania; Consulting Urologist, Delaware County Hospital; Special Consultant to United States Public Health Service; etc. With 443 illustrations, nineteen of them in color. Philadelphia and London: W. B. Saunders Company. 1940. Price \$10.00.

**METHODS FOR DIAGNOSTIC BACTERIOLOGY.** A Complete Guide for the Isolation and Identification of Pathogenic Bacteria for Medical Bacteriology Laboratories. By Isabelle G. Schaub, A.B., Assistant in Bacteriology, Department of Pathology and Bacteriology, The Johns Hopkins University School of Medicine, and M. Kathleen Foley, A.B., Bacteriologist in Charge of the Diagnostic Bacteriological Laboratory of the Medical Clinic, The Johns Hopkins Hospital, Baltimore, St. Louis: The C. V. Mosby Company. 1940. Price \$3.00.

**MEDICAL DISEASES OF WAR.** By Sir Arthur Hurst, M.A., D.M., (Oxon.) F.R.C.P., Lieutenant-Colonel, Late R.A.M.C.; Consulting Physician to Guy's Hospital and Late Officer Commanding Seale Hayne Hospital for Functional Nervous Disorders, etc. With the cooperation of H. W. Barber, M.A., M.B., Cantab., F.R.C.P., Physician-in-Charge of the Skin Department, Guy's Hospital; F. A. Knott, M.D., Lond., M.R.C.P., Bacteriologist to Guy's Hospital, and T. A. Ross, M.D., Edin., F.R.C.P., Late Medical Director of the Cassel Hospital for Functional Nervous Disorders. Baltimore: The Williams & Wilkins Company. 1940. Price \$5.50.

**VITAMIN THERAPY IN GENERAL PRACTICE.** By Edgar S. Gordon, M.D., M.A., Associate in Medicine and Instructor in Physiological Chemistry, University of Wisconsin, and Elmer L. Sevringhaus, M.D., F.A.C.P., Professor of Medicine, University of Wisconsin, etc. Chicago: The Year Book Publishers, Inc. 1940. Price \$2.75.

**A TREATISE ON MEDICOLEGAL OPHTHALMOLOGY.** By Albert C. Snell, M.D., Lecturer in Ophthalmology, School of Medicine and Dentistry, University of Rochester; Consultant in Ophthalmology, Strong Memorial Hospital, and Rochester General Hospital, etc. Illustrated. St. Louis: The C. V. Mosby Company. 1940. Price \$6.00.

**SYNOPSIS OF MATERIA MEDICA, TOXICOLOGY AND PHARMACOLOGY.** For Students and Practitioners of Medicine. By Forrest Ramon Davison, B.A., M.Sc., Ph.D., M.B., Assistant Professor of Pharmacology in the School of Medicine, University of Arkansas, Little Rock. With forty-five illustrations, including four in color. St. Louis: The C. V. Mosby Company. 1940. Price \$5.00.

**BACILLARY AND RICKETTSIAL INFECTIONS, ACUTE AND CHRONIC, A TEXTBOOK.** Black Death to White Plague. By William H. Holmes, Professor of Medicine, Northwestern University Medical School, Chairman, Department of Medicine, Passavant Memorial Hospital, Chicago. New York: The Macmillan Company. 1940. Price \$6.00.

**BIOCHEMISTRY OF DISEASE.** By Meyer Bodansky, Ph.D., M.D., Director of the John Sealy Memorial Laboratory and Professor of Pathological Chemistry, University of Texas School of Medicine, and Oscar Bodansky, Ph.D., M.D., Lecturer in Biochemistry, Graduate Division, Brooklyn College, etc. New York: The Macmillan Company. 1940. Price \$8.00.

**PSYCHIATRY FOR NURSES.** By Louis J. Karnosh, B.S., Sc.D., M.D., Associate Clinical Professor of Nervous Diseases, School of Medicine, Western Reserve University; Director of Neuropsychiatry, City Hospital, Cleveland; Consulting Neuropsychiatrist, Cleveland Clinic, and Edith B. Gage, R.N., Supervisor, Neuropsychiatric Division, City Hospital, Cleveland. Illustrated. St. Louis: The C. V. Mosby Company. 1940.

**PHARMACOLOGY AND THERAPEUTICS.** By Arthur R. Cushny, M.A., M.D., LL.D., F.R.S., Late Professor of Materia Medica and Pharmacology in the University of Edinburgh. Twelfth edition, thoroughly revised by C. W. Edmunds, A.B., M.D., Professor of Materia Medica and Therapeutics in the University of Michigan, Ann Arbor, Michigan, and J. A. Gunn, M.A., M.D., D.Sc., F.R.C.P., Professor of Pharmacology and Director of the Nuffield Institute for Medical Research, University of Oxford, England. Illustrated with 66 engravings. Philadelphia: Lea & Febiger. 1940. Price \$6.50.



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**IMMUNE-BLOOD THERAPY OF TUBERCULOSIS.** With Special References to Latent and Masked Tuberculosis. By Joseph Hollos, M.D. Boston: Bruce Humphries, Inc. 1940. Price \$2.50.

**PHYSICAL DIAGNOSIS.** By Ralph H. Major, M.D., Professor of Medicine in the University of Kansas. Second edition, revised with 437 illustrations. Philadelphia and London: W. B. Saunders Company. 1940.

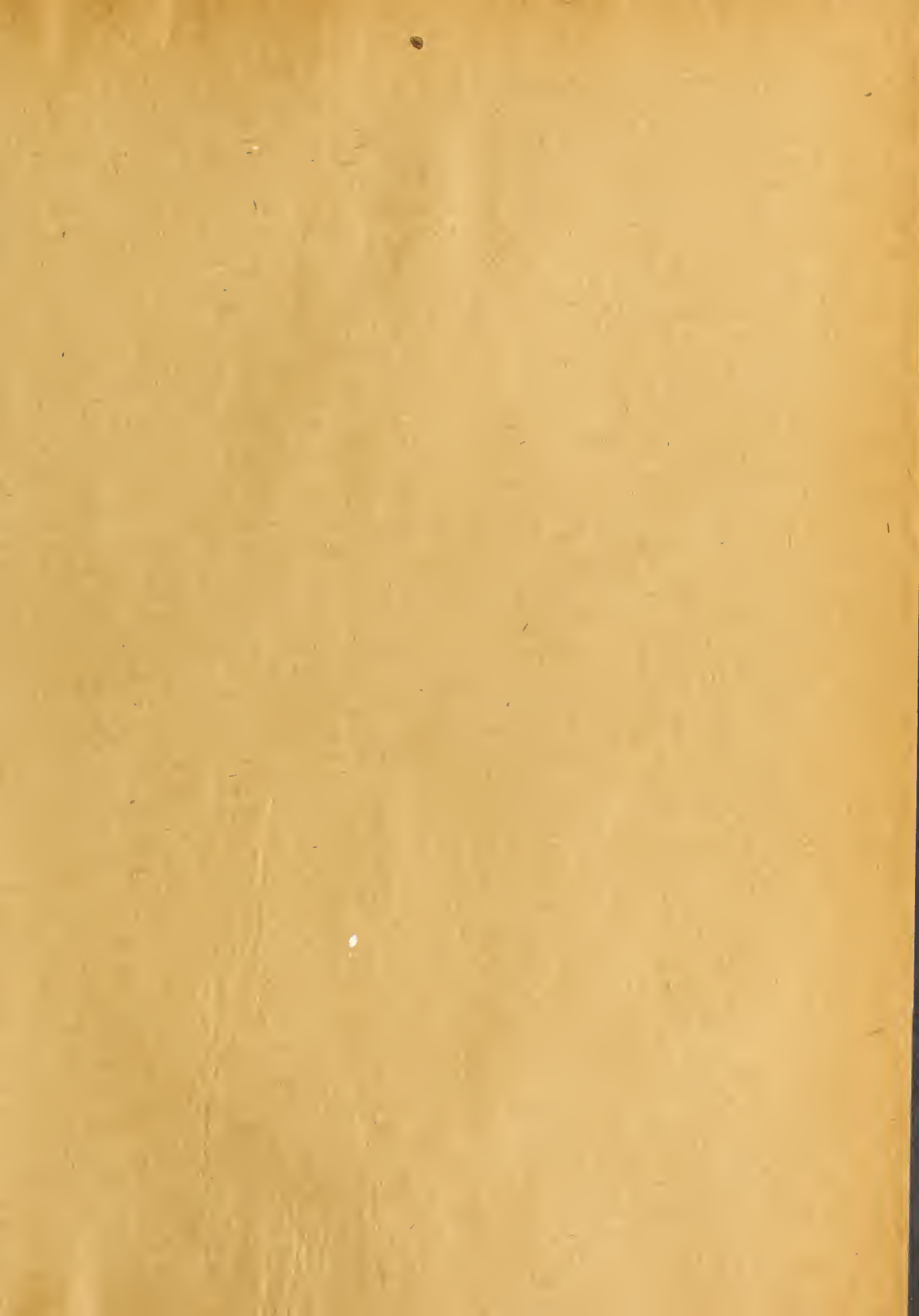
**GETTING READY TO BE A MOTHER.** By Carolyn Conant Van Blarcom. Revised by Hazel Corbin, General Director Maternity Center Association. Fourth edition. New York: The Macmillan Company. 1940. Price \$2.50.

**APPLIED PHARMACOLOGY.** By Hugh Alister McGuigan, Ph.D., M.D., F.A.C.P., Professor of Pharmacology and Therapeutics, University of Illinois, College of Medicine. Illustrated. St. Louis: The C. V. Mosby Company. 1940. Price \$9.00.

**A TEXTBOOK OF PATHOLOGY.** By W. G. MacCallum, Professor of Pathology and Bacteriology, The Johns Hopkins University, Baltimore. Seventh edition, thoroughly revised. Philadelphia and London: W. B. Saunders Company. 1940. Price \$10.00.

**THE INJURED BACK AND ITS TREATMENT.** Edited by John D. Ellis, M.D. Contributing Authors: H. Earle Conwell, M.D., Birmingham; Loyal Davis, M.D., Chicago; Nathan S. Davis, III, M.D., Chicago; John D. Ellis, M.D., Chicago; Ralph K. Ghormley, M.D., Rochester; Hale A. Haven, M.D., Seattle; Professor Sir Arthur Keith, F.R.C.S., F.R.S., London, and Robert B. Osgood, M.D., Boston. Springfield, Illinois, and Baltimore, Maryland: Charles C. Thomas, Publishers. 1940. Price \$5.50.









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